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Cambridge University of Astronomical Observations

TORAGE

ASTRONOMICAL  
OBSERVATIONS

MADE AT THE  
OBSERVATORY OF CAMBRIDGE

BY

THE REV. JAMES CHALLIS, M.A.

PLUMIAN PROFESSOR OF ASTRONOMY AND EXPERIMENTAL PHILOSOPHY  
IN THE UNIVERSITY OF CAMBRIDGE,  
AND LATE FELLOW OF TRINITY COLLEGE.

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## P R E F A C E.

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THE Meridian Observations contained in this Volume, were principally directed, as in the six preceding Volumes of the Cambridge Observations, to the determination of Geocentric Right Ascensions and North Polar Distances of the Sun, Moon, and all the Planets. In subordination to this object the places of a considerable number of stars have also been determined. With the Northumberland Equatoreal and the Five-feet Equatoreal micrometer measures were taken of differences of North Polar Distance of Mars in opposition and neighbouring stars, with the view of furnishing data for calculating the parallax of the planet, and at the same time of deducing its North Polar Distances from the known North Polar Distances of the stars. With the same instruments Right Ascensions and North Polar Distances of Galle's First Comet were observed at the close of 1839 and the beginning of 1840. These, with occultations of fixed stars by the Moon, the number of which is large, and micrometer measures of diameters of the Planets, make up the extra-meridional observations recorded and reduced in this Volume. Observations of double and multiple stars were also made with the Northumberland Equatoreal in 1839; but as yearly publication of this class of observations is not of importance, they will be inserted, together with all that may accumulate in the intervening time, in a future Volume.

The reductions of all the observations have been conducted with the same regard to accuracy, and have been as carefully examined, as in former years. To give as much value as possible to the results of observations with the Northumberland Equatoreal, I have paid particular attention to its adjustments, and to the determination of the instrumental constants employed in the calculations.

In consequence of a different arrangement in the printing, and of some curtailment of the Introduction, this Volume is not equal in bulk to those of the two preceding years, but it contains nearly the same number of observations.

Loss of health in the autumn of 1840, by which I was prevented nearly four months taking an active part in the business of the Observatory, has been the chief cause of the unusual delay in the appearance of the Volume. The reducing of the observations of Galle's First Comet, which, though made principally in 1840, are inserted in this Volume for the purpose of exhibiting the series collectively, has contributed also to retard the publication.

J. CHALLIS.

CAMBRIDGE OBSERVATORY,  
Dec. 3, 1841.





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## ERRATA.

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### IN THE VOLUME FOR 1836.

Page (40). The observation of the ✕ N.P.D.  $76^{\circ}.45'$  on Aug. 3 was confused and probably affected with error in counting, as no star of the same R.A. has since been seen. The time of observation of Pallas at Wire VII, viz. 21. 10. 10,5, was correct.

p. (97) and p. (99). The ✕ N.P.D.  $76^{\circ}.45'$  should be rejected.

p. 10. The approximate R.A. of the anonymous star observed on April 22 should be  $11^{\text{h}}.16^{\text{m}}.37^{\text{s}}$ , as appears from transit observations in 1839. The same correction is required in p. 103 and p. 110.

### IN THE VOLUME FOR 1837.

p. lxxvii. line 8. For 'assumed longitude of the Cambridge Observatory' read, 'sidereal time of observation.' See p. xliii. of the present Volume.

p. 5. R.A. of ✕ (i); for 9.14.2 read 9.14.35, nearly as given in p. (142) Feb. 13 from a transit observed with the circle. The R.A. in the Nautical Almanac for 1837 (p. 476) is erroneous.

p. 15. R.A. of ✕ (i), for 9.14.2 read 9.14.35.

### IN THE VOLUME FOR 1838.

p. xci. line 1. For 'assumed longitude of the Cambridge Observatory' read, 'sidereal time of observation.' See p. xliii of the present Volume.

p. (71). Assumed R.A. of the ✕ of Nos. 11, 12 and 13; for 17.46.6,17 read 17.46.28,95. In the seconds of concluded R.A. of the comet of the same Nos., for 57,15, 54,31, and 51,03, read 57,31, 54,47, and 51,19; and in the seconds of the Errors of Tables, for 20,22, 21,50, and 23,09, read 20,38, 21,66, and 23,25.

### IN THE PRESENT VOLUME.

p. 18. Note (d). The star observed is the right one; there is no star having the same R.A. as that of ✕ (i) in p. 476 of Nautical Almanac for 1837.

p. 59. Instead of the meridian error  $+1''.18$  adopted from Sept. 5, the previous meridian error  $+0''.85$  should have been continued. The alteration will not sensibly affect the calculations.

p. 113. Semi-diameter of Venus March 26, for 5,54 read 5,61; and in the geocentric N.P.D. of centre, for 29,68 read 29,61.

p. 127. Semi-diameter of Mars May 17, for 10,02 read 5,01; and in the geocentric N.P.D. of centre, for 58,98 read 53,97.

p. 149. Moon's semi-diameter Aug. 24, for 6,24 read 6,36. The seconds of geocentric N.P.D. will consequently be 15,62, 17,59, 18,55 18,22, and 18,07.

In the Introduction, pages xiv and xv are in the places of pages x and xi, and the latter in the places of pages xiv and xv.







# CAMBRIDGE OBSERVATIONS.

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## INTRODUCTION.

A DESCRIPTION of the *Instruments* employed in the Observations contained in this Volume, and an account of the *methods of observing*, are given in detail in the Introduction to the Observations of 1838, and in the Introductions of previous Volumes: all that it will be necessary to say in addition respecting the Northumberland Equatoreal will be found under the head of EXTRAMERIDIONAL OBSERVATIONS.

## MERIDIONAL OBSERVATIONS.

### I. *Transits as Observed, and Calculation of Apparent Right Ascensions.*

The first division of the tabular portion of the work is allotted to the Transit Observations and the Calculation of Apparent Right Ascensions. The *left-hand* pages record the transits as they were observed, with no other results of calculation than the corrections for reducing the mean of the observed times of transit over part of the wires, to the time of transit over the mean of all the wires.

The *first column* contains the day of the month, supposed always to commence with the Sun's meridian passage.

The *second column* contains the names of the objects observed. With respect to nomenclature, the following rule was adopted in the Volume of Observations for 1837, and for the sake of uniformity has been adhered to in this. Stars contained in the Nautical Almanac of 1839 have the same names here given them as in that work: Stars in the Astronomical Society's Catalogue and not in the Nautical Almanac, are named, in preference, by the letters in that Catalogue attached to the name of the constellation: next, by Flamsteed's numbers attached; and in default of these, by merely the numbers of the Catalogue. All other stars are named by their approximate North Polar Distances.

In the second column are also stated (in small type) such circumstances of the observations as could be expressed briefly: which are principally those depending on atmospheric causes. Longer remarks, and such as relate to mistakes in observing, are introduced at the bottom of the page. To give an opportunity of judging of the weight due to individual observations, it was thought right to omit the mention of no circumstance which seemed in any way to affect an observation, especially when the object observed was the Sun, Moon, or a Planet.

In observing a double star, the brighter of the two is taken. If the stars are of nearly equal magnitude, the one observed is distinguished as *preceding* or *following*.

The *seven succeeding columns* contain the times, by the Transit clock, of passage over the seven wires. The hour and minute in the seventh of these columns always refer to the wire last observed.

When, as not unfrequently happens from atmospheric and accidental causes, the times of transit across all the wires cannot be observed, a correction is necessary for reducing the mean of the observed times to the time of transit over the mean of all the wires. This reduction is effected by adding (with the proper sign) to the mean of the observed times, the sum, divided by the number of wires observed, of the distances in time of the omitted wires from the mean of all.

At the beginning of 1839 I inserted a new system of wires. The intervals from the mean of all, corresponding to a given declination, were calculated from the intervals between consecutive wires derived from observations of Polaris and  $\delta$  Ursæ Minoris, and reduced to that declination. The following Tables were then computed in the manner explained at p. xiv of the Introduction to the Volume for 1837. On account of an irregularity in one of the wires different values of the intervals were used for different portions of the year. The wires are distinguished by the letters *A, B, C, D, E, F, G*; and stars above the pole pass them in this order when the illuminated end of the axis is East.

Order of Wires.	Interval of each wire from the mean of all.		
	For Equatoreal Stars.	For $\delta$ Ursæ Minoris. Declination = $86^{\circ}.35' + n''$ .	For Polaris. Declination = $88^{\circ}.27' + n''$ .
A	$-40,687$	$-11.22,99 - n \times 0,056$	$-25.7,24 - n \times 0,271$
B	$-26,805$	$-7.29,85 - n \times 0,037$	$-16.31,83 - n \times 0,178$
C	$-13,609$	$-3.48,37 - n \times 0,018$	$-8.23,24 - n \times 0,090$
D	$+0,104$	$+1,74$	$+3,83 + n \times 0,001$
E	$+13,548$	$+3.47,33 + n \times 0,018$	$+8.20,96 + n \times 0,090$
F	$+26,999$	$+7.33,12 + n \times 0,037$	$+16.39,03 + n \times 0,179$
G	$+40,452$	$+11.19,03 + n \times 0,055$	$+24.58,45 + n \times 0,270$
A	$-40,609$	$-11.21,68 - n \times 0,056$	$-25.4,31 - n \times 0,271$
B	$-26,822$	$-7.30,14 - n \times 0,037$	$-16.32,47 - n \times 0,178$
C	$-13,627$	$-3.48,66 - n \times 0,018$	$-8.23,89 - n \times 0,090$
D	$+0,092$	$+1,54$	$+3,40 + n \times 0,001$
E	$+13,516$	$+3.46,81 + n \times 0,018$	$+8.19,81 + n \times 0,090$
F	$+26,997$	$+7.33,07 + n \times 0,037$	$+16.38,94 + n \times 0,179$
G	$+40,454$	$+11.19,06 + n \times 0,055$	$+24.58,51 + n \times 0,270$
A	$-40,289$	$-11.16,30 - n \times 0,055$	$-24.52,39 - n \times 0,268$
B	$-26,863$	$-7.30,82 - n \times 0,037$	$-16.33,96 - n \times 0,178$
C	$-13,668$	$-3.49,35 - n \times 0,019$	$-8.25,40 - n \times 0,091$
D	$+0,044$	$+0,74$	$+1,63$
E	$+13,467$	$+3.45,97 + n \times 0,018$	$+8.17,96 + n \times 0,089$
F	$+26,933$	$+7.32,00 + n \times 0,037$	$+16.36,57 + n \times 0,179$
G	$+40,376$	$+11.17,76 + n \times 0,055$	$+24.55,63 + n \times 0,269$

The first of the above tables was calculated from all the values of the intervals of consecutive wires given by the observations of Polaris and  $\delta$  Ursæ Minoris from the beginning of the year to Feb. 20, and is used during that interval. The second table was calculated from all the intervals of consecutive wires derived from the observations of Polaris from Feb. 20 to July 25, and is used to July 27. The third table was similarly calculated from the observations of Polaris and  $\delta$  Ursæ Minoris from Aug. 1 to Nov. 12, and is used from the beginning of July 31 to the end of year. The three tables compared shew that the wires were all stationary except *A*. At the end of July I suspected that this wire adhered to one of the cross horizontal wires, and touched it gently to disengage it. It has since retained a fixed position. As an examination of the intervals shewed that they underwent no perceptible change during the respective periods for which the above tables are used, and as the observations are always made at the same part of



the field, it is impossible that the irregularity of the wire *A* can have had any injurious effect on the observations.

Besides the cosecant of N.P.D., by which the numbers for equatoreal stars are multiplied when the N.P.D. is not very small, a factor is used for the Sun and Planets, which is deduced from the horary variation of their R.A. given in the Nautical Almanac. The multiplier for the Moon takes account of the variation of R.A. as affected by parallax, and is calculated from the expression

$$\frac{3600 + I}{3600} \times \frac{\sin \text{Moon's geocentric Z.D.}}{\sin \text{Moon's apparent Z.D.}} \times \text{cosecant of N.P.D.},$$

where *I* is the increase of the Moon's R.A. in passing over 1<sup>h</sup> of terrestrial longitude, given under the head of Moon-culminating Stars in the Nautical Almanac.

The first limb of Jupiter and the first limb of Saturn's Ring are usually observed at the wires *A*, *C*, *E*, and *G*; and the second limbs at the wires *B*, *D*, and *F*. The observation of each limb is corrected to the mean of all the wires by the foregoing tables.

The corrections to the mean of all the wires occupy the *tenth column*.

The *eleventh column* contains the initial of the observer's name. The observations marked *C* are by myself, those marked *B* by Mr Baldrey, and those marked *G* by Mr Glaisher.

The space immediately below the columns contains notices of the position of the instrument and the order of the wires, together with the times of reversing and levelling it, and of putting forward the minute hand of the clock.

The concluded times of transit over the mean of the seven wires, as given by the clock, are placed in the *first column* of the *right-hand* pages. The succeeding columns contain the elements of the calculation by which the Apparent Right Ascensions are inferred from these times; which is done by applying corrections for *Error of Collimation*, *Level Error*, *Meridian Error*, and *Clock Error*. The methods of obtaining these corrections will here be severally stated in the order of their application.

*Error of Collimation.*—A wooden cross in the form of X, placed so that the vertical micrometer-wire can be brought to bisect its acute angles, serves as a southern mark for determining the error of collimation. It is fixed on the tower of Grantchester church, at the distance of about 2½ miles, and its angular distance West of the meridian is about 14". To avoid any error that may arise from a change of position of the axis of the instrument by the reversion, a northern mark is also used. Instead of a fixed northern mark, for which there is no convenient object, a small transit instrument is put up as a horizontal collimator in the northern opening for the shutters, and the micrometer-wire is applied to a selected point of the image of one of its wires. This is found in practice to answer well enough the required purpose.

The following are the observations which I made for the determination of the collimation error in 1839.

Jan. 2. 2½<sup>h</sup>. The reversion of the Transit on this day is recorded in the Introduction of the Observations of 1838. No use was made in 1839 of the resulting collimation error, the new set of wires having been put in shortly after the reversion.

Jan. 23. 3<sup>h</sup>. The instrument was *twice* reversed, to leave it in the position it had before the reversion of Jan. 2. The cross was steady, but rather faint. The wire of the collimator was indistinctly seen after the second reversion on account of the decline of day-light.

*Illuminated End of Axis East.*

Mean of 6 readings, micrometer-wire coincident with <i>D</i> .....	24,433
..... 6 ..... bisecting South mark .....	23,279
..... 6 ..... bisecting North mark .....	20,511

*Illuminated End of Axis West.*

	r.
Mean of 6 readings, micrometer-wire bisecting North mark .....	28,100
..... 6 ..... bisecting South mark .....	25,343
..... 8 ..... coincident with <i>D</i> .....	24,419

*Illuminated End of Axis East.*

	r.
Mean of 6 readings, micrometer-wire coincident with <i>D</i> .....	24,430
..... 7 ..... bisecting South mark .....	23,311
..... 7 ..... bisecting North mark .....	20,539

Hence, by the first reversion,

	r.
Reading for line of collimation by South mark.....	24,311
..... North mark.....	24,306
Reading for true line of collimation .....	24,309
Reading for <i>D</i> .....	24,426

By the second reversion,

	r.
Reading for line of collimation by South mark.....	24,327
..... North mark.....	24,320
Reading for true line of collimation .....	24,323
Reading for <i>D</i> .....	24,425

Consequently the error of collimation of *D* by the first reversion is 0",117, which in arc is 2",00, the value of one micrometer revolution being 17",06. By the second reversion the error of collimation of *D* is 0",102 or in arc 1",74. In both, the reading for *D* is greater than that for the true line of collimation, and therefore the mean of the two results is 1",87. As the micrometer readings increase in going from the illuminated end of the axis, a star entering from the West will come to *D* before coming to the true line of collimation, the illuminated end being East. Hence considering, (as is generally done in this work) an error positive when it requires a positive correction, the error of collimation of *D* will be +1",87. And it appears by the Table in p. ii that prior to Feb. 20, equatoreal stars came to the mean of the wires before coming to *D* by the interval 0",104, or in arc, 1",56. Hence adding -0",18 for diurnal aberration, the concluded error of collimation of the mean of the wires = +1",87 + 1",56 - 0",18 = +3",25. After Feb. 20 the interval from the mean of the wires to *D* is 0",092 or in arc 1",38 (see p. ii), and the consequent error of collimation of the mean of the wires is +3",07.

April 9, 4<sup>h</sup>. Transit reversed. The cross was faint before reversion and still fainter after, but very steady throughout. The collimator was so much shaken by the wind as to render the measures in some degree doubtful.

*Illuminated End of Axis East.*

	r.
Mean of 6 readings, micrometer-wire coincident with <i>D</i> .....	24,416
..... 6 ..... bisecting South mark .....	23,253
..... 7 ..... bisecting North mark .....	17,143

*Illuminated End of Axis West.*

	r.
Mean of 9 readings, micrometer-wire bisecting North mark .....	31,596
..... 6 ..... bisecting South mark .....	25,253
..... 6 ..... coincident with <i>D</i> .....	24,401
Reading for line of collimation by South mark.....	24,253
..... North mark.....	24,369
Reading for true line of collimation .....	24,311
Reading for <i>D</i> .....	24,408

Hence the error of collimation of *D* after the reversion is -0",097, or -1",66; and the concluded error of collimation of the mean of the wires = -1",66 - 1",38 - 0",18 = -3",22.



June 6, 6 $\frac{1}{2}$ <sup>h</sup>. The Transit was reversed under unfavorable circumstances. The cross being very unsteady after the reversion, a second set of measures were taken at 8<sup>h</sup>, when it became more steady, which however gave very nearly the same result as that recorded below. The observations with the collimator's wire were satisfactory.

*Illuminated End of Axis West.*

Mean of 6 readings, micrometer-wire coincident with <i>D</i> .....	r. 24,228
..... 6 ..... bisecting South mark.....	25,219
..... 6 ..... bisecting North mark.....	28,284

*Illuminated End of Axis East.*

Mean of 6 readings, micrometer-wire bisecting North mark.....	r. 20,307
..... 8 ..... bisecting South mark.....	23,395
..... 6 ..... coincident with <i>D</i> .....	24,231
Reading for line of collimation by South mark.....	24,307
..... North mark.....	24,296
Reading for true line of collimation .....	24,301
Reading for <i>D</i> .....	24,230

Since the reading for *D* is less than that for the true line of collimation, and the illuminated end of the axis is East, the error of collimation of *D* is  $-0.071$  or  $-1''.21$ . Hence the concluded error of collimation of the mean of the wires from June 6 is  $-1''.21 + 1''.38 - 0''.18$  or  $-0''.01$ . From July 31 the equatoreal interval from the mean of the wires to *D* is  $0.044$  or  $0''.66$ , (see p. ii) and consequently the error of collimation from that date is  $-1''.21 + 0''.66 - 0''.18$ , or  $-0''.73$ .

Just before this reversion the wire-frame was shifted to diminish the amount of collimation error. By an observation on May 30 at 8<sup>h</sup> the coincidence reading of *D* was 24,410, which we may consider to be the reading on June 6. After the shifting of the wires, the coincidence reading was 24,228. Consequently the frame was moved through  $0.182$  or  $3''.11$  towards the *West*. Hence the error of collimation before the reversion was  $+1''.21 - 1''.38 - 0''.18 - 3''.11$ , or  $-3''.46$ , which agrees well enough with the determination of April 9.

Sept. 19, 2<sup>h</sup>. The Transit was reversed under favorable circumstances.

*Illuminated End of Axis East.*

Mean of 6 readings, micrometer-wire coincident with <i>D</i> .....	r. 24,218
..... 6 ..... bisecting South mark .....	23,394
..... 6 ..... bisecting North mark .....	20,998

*Illuminated End of Axis West.*

Mean of 6 readings, micrometer-wire bisecting North mark .....	r. 27,594
..... 6 ..... bisecting South mark .....	25,270
..... 6 ..... coincident with <i>D</i> .....	24,208
Reading for line of collimation by South mark.....	24,332
..... North mark.....	24,296
Reading for true line of collimation .....	24,314
Reading for <i>D</i> .....	24,213

The error of collimation of *D* =  $+0.101$  or  $+1''.72$ , and hence the concluded error of collimation of the mean of the wires =  $+1''.72 - 0''.66 - 0''.18 = +0''.88$ . A reversion on Jan. 9, (1840) gave for error of collimation before reversion  $+1''.10$ , differing little from the foregoing value, which is therefore used from Sept. 19 to the end of the year.

The values of collimation error adopted in the reduction of the Transits, and the limits within which they are used, are mentioned in the space immediately below the columns of the right-hand pages.

$$\frac{1}{15} \times \text{collimation error} \times \text{cosec. of N.P.D.,}$$

*Level Error.*—The deviation of the axis about which the Transit turns from a horizontal plane, is found by applying to the pivots a spirit-level, furnished with a cross-level adjustment, and with graduated scales for reading off the positions of the extremities of the bubble. It is the practice to reverse the level five times, and thus obtain six eastern and six western readings, the scales being first disposed in positions convenient for reading off, which they retain during the whole of the operation. In the graduation of each scale the numbers increase in the direction from the middle of the bubble towards the extremity. Hence the algebraic *excess* of the sum of the western above the sum of the eastern readings, divided by the whole number of readings, is the measure, in degrees of the scales, of the *elevation* of the west end of the axis above a horizontal plane. This supposes the pivots to be exactly cylindrical and equal.

The method of correcting for an inequality of the radii of the pivots is explained in the Introduction to the Volume for 1837, at page xxviii; where it is also shewn, that the mean result of levellings just before and after four reversions of the Transit towards the close of 1837, makes the radius of the pivot at the illuminated end of the axis smaller than the other by a quantity measured on the scale by the fractional part 0<sup>o</sup>.033 of a division. The following table exhibits the results of levellings taken just before and after subsequent reversions in 1838 and 1839. The levellings were all taken by myself.

No. of Series.	Day and Hour of Observation, 1838.	Position of Illuminated end of Axis.	Sum of six East Readings.	Sum of six West Readings.	One twelfth the excess of the latter sum above the former.	Error of the Level due to inequality of the pivots.
1	Jan. 3. <sup>d. h.</sup> 2	West	<sup>0</sup> 72,9	<sup>0</sup> 51,5	<sup>0</sup> - 1,78	<sup>0</sup>
2	2 <sup>1</sup> / <sub>4</sub>	East	71,6	54,4	1,43	- 0,081
3	3 <sup>3</sup> / <sub>4</sub>	West	85,8	62,7	1,92	- 0,113
4	Feb. 28. 4 <sup>1</sup> / <sub>2</sub>	West	75,3	45,8	2,46	
5	5	East	78,1	50,0	2,34	- 0,028
6	April 30. 2	East	89,4	51,5	3,16	
7	3 <sup>1</sup> / <sub>2</sub>	West	71,3	25,2	3,84	- 0,157
8	30. 2 <sup>1</sup> / <sub>4</sub>	East	77,8	43,9	2,82	
9	4	West	75,5	22,5	4,42	- 0,369
10	June 21. 3 <sup>1</sup> / <sub>2</sub>	West	94,7	34,3	5,03	
11	6 <sup>1</sup> / <sub>2</sub>	East	95,1	37,3	4,82	- 0,048
12	21. 4	West	96,5	31,6	5,41	
13	7	East	95,3	42,5	- 4,40	- 0,233
14	Oct. 8. 3	East	52,4	87,8	+ 2,95	
15	4	West	50,1	85,4	2,94	- 0,002
16	1839. Jan. 2. 2	West	43,0	85,9	3,57	
17	3	East	40,8	91,1	4,19	- 0,143
18	23. 3	East	42,4	86,6	3,68	
19	3 <sup>1</sup> / <sub>2</sub>	West	45,5	88,9	3,62	- 0,014
20	4	East	43,1	92,1	+ 4,08	- 0,106

N<sup>os</sup>. 3 and 6, were considered unsatisfactory. N<sup>os</sup>. 4 and 5 were good.  
N<sup>os</sup>. 8, 9, 12 and 13, were taken with the Telescope inclined at an angle of 45°; all the rest with the Telescope horizontal.  
Before N<sup>o</sup>. 14, the screws for the vertical adjustment of the axis were moved.



Each of the results in the last column is a value of  $\varepsilon$ , calculated by equating one of the two adjacent numbers of the last column but one to  $x + y + \varepsilon$ , and the other to  $x - y - \varepsilon$ , according as the illuminated end of the axis is *West* or *East*, and by assuming  $y$  to be to  $\varepsilon$  in the ratio of 7 to 6. Excluding the observations made with the telescope in the inclined position, the mean of the 9 remaining results is  $-0^{\circ},077$ . And the mean of 4 obtained in 1837 was  $-0^{\circ},033$ . Giving to all the same weight, the concluded mean is  $-0^{\circ},063$ , which is equal to  $-0'',08$ , since  $1^{\circ}$  of the scale  $= 1'',3$ . Hence, when the Telescope is horizontal, the radius of the pivot at the *illuminated* end appears to be *less* than that of the other, by a quantity which causes an error of  $0'',08$  in determining by the level the inclination of the axis to a horizontal plane. This error would be the same in all positions of the Telescope if the pivots were both exactly cylindrical, or if they deviated from the cylindrical form in a similar manner. The results obtained in the inclined position of the Telescope seem to indicate an anomalous deviation from the cylindrical form.

The following Table, exhibiting the results of levelling in different positions of the Telescope, is a continuation of that given in p. xxiii. of the Introduction of the Volume of 1838.

Day and Hour of Observation. 1838.	Position of			Sum of East Readings.	Sum of West Readings.	Half the Mean Excess of the latter.	Difference of Excesses.
	Telescope.	Object Glass.	Illuminated End of Axis.				
June 21. $3\frac{1}{2}$ 4	Horizontal Inclined at $45^{\circ}$	South South	West West	$94,7$ $96,5$	$34,3$ $31,6$	$-5,03$ $5,41$	$0$ $+0,38$
$6\frac{1}{2}$ 7	Horizontal Inclined at $45^{\circ}$	South South	East East	$95,1$ $95,3$	$37,3$ $42,5$	$4,82$ $4,40$	$-0,42$
Aug. 30. $6\frac{1}{2}$ 7	Horizontal Inclined at $45^{\circ}$	South South	East East	$93,1$ $121,5^*$	$25,9$ $38,5^*$	$5,60$ $-5,19$	$-0,41$
1839. Feb. 23. 4 4 $4\frac{1}{2}$ $4\frac{3}{4}$	Inclined at $45^{\circ}$ Horizontal Inclined at $45^{\circ}$ Horizontal	South South North North	East East East East	$33,5$ $37,7$ $33,0$ $36,3$	$87,4$ $86,5$ $87,9$ $86,6$	$+4,49$ $4,07$ $4,57$ $+4,19$	$-0,42$ $-0,50$ $-0,38$
* The number of readings was 8 in these instances: in every other it was 6.							

The results in the last column, which were obtained by subtracting the numbers of the preceding column for the inclined position of the Telescope from those for the horizontal, agree with the previous results of 1838, in making the elevation of the *West* end of the axis *greater* in the horizontal than in the inclined position, when the illuminated end is *West*, and *less* by about the same quantity when the illuminated end is *East*, whether the object-glass be northward or southward. The mean of the six values (taken independently of sign) is  $0^{\circ},42$ ; and the mean of the eight values before obtained was  $0^{\circ},45$ . Hence the concluded mean  $= 0^{\circ},44$ , which in arc is  $0'',55$ . This difference, which is probably owing to unequal variations of the pivots from the cylindrical form, consists in part ( $y$ ) of a difference of inclination of the axis, and in part ( $\varepsilon$ ) of a difference of inclination of the level. Since therefore  $y + \varepsilon = 0'',55$ , and  $6y - 7\varepsilon = 0$ , it follows that  $y = 0'',30$ . Hence if  $n''$ , be the uncorrected level error, that is, the elevation of the *West* end determined in the usual manner by levelling with the Telescope horizontal, the correct level error, when the illuminated end of the axis is *West*, is  $n'' + 0'',08$  for the horizontal position, (see above) and  $n'' + 0'',08 - 0'',30$ , or  $n'' - 0'',22$  for an inclination of  $45^{\circ}$ . Giving to the latter double weight, as applying to a position near which the principal observations are taken, the result is  $n'' - 0'',12$ . Similarly the corrected level error when the illuminated end of the axis is *East*, is  $n'' + 0'',12$ . These corrections are applied from the beginning of 1839. The values adopted for *Polaris* and  $\delta$  *Ursæ Minoris* are  $n'' - 0'',22$  and  $n'' + 0'',22$ .

The above details shew that the inequality of the size of the pivots, and the irregularity of their forms are too inconsiderable to have any effect on the observations.

When the *West* end of the axis is the more elevated, the plane in which the line of collimation moves deviates to the *East*, and stars above the pole, *cæteris paribus*, come

to it *before* coming to the meridian. Hence the observed time of transit requires a positive or negative correction, according as the sum of the western readings of the level is greater or less than the sum of the eastern. Half the algebraic excess of the mean of the western above the mean of the eastern readings, converted into arc by multiplying by  $1''.3$  the angular value of the unit of the scales, and corrected as above stated, is the level error inserted together with the time of using it, in the space below the columns of the right-hand page.

The numerical correction applied to the observed time of each transit, previously corrected for error of collimation, is, in seconds of time,

$$\frac{1}{15} \times \text{level error} \times \text{cosine of Z.D.} \times \text{cosecant of N.P.D.},$$

the N.P.D. being negative when the star is below the pole.

The levelling is commonly performed on the Monday of each week, and the determination is used from the third or fourth day previous. The time of levelling, and the number of levellings (if more than one) from which the level error is obtained, are mentioned in the space below the columns of the left-hand page.

*Meridian Error.*—The angle by which the plane of motion of the true line of collimation, (supposing the level error corrected,) deviates from the plane of the meridian, has been generally found by means of two or more transits of Polaris or  $\delta$  Ursæ Minoris, alternately above and below the pole, and as often as possible, consecutive. The following is the mode of conducting the calculation for this purpose.

Let  $T$  represent the time in which the circumpolar star describes the portions of its small circle which lie between the plane of the meridian and the vertical plane in which the axis of the Telescope is now supposed to move. If the star had no motion in R.A. and the clock no rate, the time  $T$  would be the difference between  $12^h$  and the interval from one transit to the next, as inferred from the observed times of transit corrected for collimation and level errors. The change of the star's R.A. and the clock's rate are taken account of by adding to the second of the observed transits, when two only are employed, the loss of the clock in  $12^h$ , and subtracting the increase of the star's R.A. in the same time. The clock's loss has usually been derived from the difference of the uncorrected transits of the same star or stars on two days near the times of observation of the circumpolar star, and the change of R.A. is taken from the Nautical Almanac. These corrections being attended to, the rule employed for finding  $T$  is to subtract algebraically the clock time (corrected for errors of collimation and level) of the *inferior* transit from that of the superior, the latter being first increased or diminished by  $12^h$ , according as the star made use of is Polaris or  $\delta$  Ursæ Minoris. The result is positive when the line of collimation deviates to the East of the meridian on the South side of the zenith, and negative when it deviates to the west. Also the observed time of transit of a star on the south side of the zenith requires a positive correction for meridian error in the former case, and a negative correction in the latter. Hence the sign of the meridian error is the same as that of  $T$  obtained as above stated. The same rule applies when the two transits are not consecutive, provided the second be corrected as before in proportion to the interval between them.

When three consecutive transits of Polaris or  $\delta$  Ursæ Minoris have been obtained, it is not necessary to correct for the clock's rate or the change of the star's R.A. For assuming these to be uniform in the interval between the first and third transits, and the times of transit to remain uncorrected, the remainders obtained by subtracting, according to the above rule, either the middle term from the two extremes, or the two extremes from the middle, will be one in defect and the other in excess by the same quantity, and half their sum will be  $T$ .



The time  $T$  being known, the meridian error in seconds of space is,

$$\frac{15 T}{2} \times \tan *'s \text{ N.P.D.} \times \text{cosec. of colatitude.}$$

The multiplier of  $T$  for Polaris is  $\frac{1}{3,027}$  and for  $\delta$  Ursæ Minoris  $\frac{1}{1,371}$ .

When more than three consecutive transits have been obtained, a value of the meridian error is deduced from the first, second, and third; another from the second, third, and fourth; and so on. If the different values are nearly equal, the mean of all is employed; when they differ considerably, they are either used separately or in groups.

In a few instances the meridian error has been determined by single transits of the circumpolar star compared with transits of known stars. By deriving from the tabular R.A. of the known star, and the observed time of its transit corrected for errors of level and collimation, an expression for the error of the clock, in which the meridian error is the only unknown quantity, and then equating it to a like expression derived from the tabular R.A. and transit of the circumpolar star, and correcting for the clock's loss in the intervening time, the value of the meridian error is deduced. This method is used for finding the *change* of meridian error between Jan. 19 and Jan. 28, whence the meridian error on the latter day is inferred from that on the former day independently determined. The meridian error adopted from May 25 is inferred from an observation of Polaris SP on May 17 compared with an observation of Polaris on June 5, allowance being made for the loss of the clock and the change of the Star's R.A. in the interval. By the results of transits of  $\beta$  Leonis and Polaris on each of these two days, it appeared that the change of meridian error in the interval was very small. The adopted value is also nearly equal to determinations by bisections of Grantchester cross on May 30 and June 6. (See p. x.)

From the comparison of the distances of the true line of collimation from Grantchester cross, determined by measures taken at 46 different reversion of the Instrument, with nearly contemporaneous determinations of the meridian error by circumpolar stars, it was found that Grantchester cross is  $14''.56$  West of the meridian. (See Introduction to the Volume for 1838, p. xxvii.) The effect of any irregularity in the form of the pivots is probably eliminated in this result. It appears, however, by comparing meridian errors obtained in 1838 by bisections of the cross and this assumed value of the distance of the cross from the meridian, with contemporaneous determinations by Polaris and  $\delta$  Ursæ Minoris, that by the former the line of collimation is more to the East than by the latter. (See Introduction of 1838, pp. xxviii—xxx.) On this account the adopted meridian errors of 1838 were for the most part means between determinations by the cross and by stars. But the corrections given in this way to the separate determinations, (in no case amounting to  $1\frac{1}{2}''$ ) do not probably ensure a greater degree of accuracy than that of the method of circumpolar stars used by itself, which has, at least, the advantage of giving the true value of the meridian error near the pole. This method has accordingly been almost exclusively made use of in 1839. Bisections of the cross were also made from time to time, and the following table exhibits a comparison of the meridian errors given by them on the supposition that the cross is  $14''.56$  West from the meridian, with the adopted meridian errors.



of its graduation and terminating at this point. If the circle were perfectly graduated, and always retained the same circular form, and if the bisections of the divisions were accurately performed, arcs for different positions of the circle, referred in this way to the same point, would be comparable with each other, though determined by only one microscope, provided also the zero of the microscope reading retained a fixed position relatively to the axis of the circle. Errors from imperfect graduation, inaccurate bisections, and deviations from the circular form, may be presumed to be corrected in a great measure by the use of six microscopes, disposed at the opposite ends of diameters, and at equal distances round the circle. It appears, however, that a residual inequality remains, of which more will be said hereafter.

No alterations in the least degree doubtful have been made of the minutes set down in the observing book. No alterations whatever have been made in the seconds set down.

The *tenth column* contains the readings of the micrometer for the objects in column 2 to which the letter *M* is attached. The times also by Molyneux of the bisection of Polaris and  $\delta$  Ursæ Minoris, either by the fixed or the micrometer wire, whenever these stars were not observed very near the true meridian, are placed in the same column.

The amount of correction for reducing an observation with the micrometer wire to the fixed wire, and that for reducing an observation at a distance from the middle wire to the middle wire, are placed in the *eleventh column*. The former is always placed first. The other depends, in the case of the fixed stars, only on the curvature of their paths in the field of view of the telescope; but for the moving bodies, it depends both on this circumstance and on the change of their N.P.D. The correction depending on change of N.P.D. as well as in every instance the interval between the place of bisection and the middle wire, are stated in the notes at the bottom of the page. These corrections are calculated by the following methods.

The micrometer correction is the difference between the micrometer reading, and the reading at coincidence of the micrometer wire with the fixed wire given at the bottom of the right-hand page. This difference is converted into arc by multiplying by 20,"873 which is the arc corresponding to one revolution of the micrometer head. As the micrometer readings increase in the direction from the fixed wire to the micrometer head, which is also the direction in which the graduation of the circle proceeds, if the micrometer reading exceed the reading at the coincidence of the wires, the telescope must be turned in the direction of the graduation to bring the object to the fixed wire. The circle reading referred to a fixed extraneous point will thus be diminished, and consequently the correction is *negative* in the case supposed, and positive when the micrometer reading is less than the reading at coincidence.

As the micrometer wire is not exactly parallel to the fixed wire, the coincidence readings at all the wires are observed from time to time, as well as more frequently the coincidence at the middle wire, and different values are used according to the position of the object in the field at the time of its bisection by the micrometer wire. The times of observing the coincidences are stated in the left-hand pages, and the new values with the dates from which they are used, are given in the right-hand pages, in the spaces below the columns.

April 10, from 6<sup>h</sup> to 7<sup>h</sup> $\frac{1}{4}$ , I made the following observations for determining the value of one revolution of the eye-piece micrometer. The micrometer wire was set alternately 15' above and 15' below the fixed wire, and brought to the top of the spire of Grantchester church. The spire was well-defined and very steady, but as the day-light declined, in the last observations it was not perfectly well seen.



Micro-meter reading.	Pointer reading.	Microscope A	B	C	D	E	F	Correction for Runs.	Concluded Circle reading.	Difference.	Mean of two consecutive differences.
0	133. 10	4. 22,3	32,2	25,7	27,7	31,4	30,9	- 3,2	133. 14. 27,83	"	"
30	133. 20	4. 46,7	57,3	51,9	52,7	56,1	55,0	- 3,5	133. 24. 52,70	10. 24,87	10. 26,18
0	133. 10	4. 19,6	29,4	24,0	25,1	28,0	28,3	- 3,2	133. 14. 25,20	10. 27,50	10. 26,74
30	133. 20	4. 45,0	56,2	50,3	51,9	53,7	53,5	- 3,5	133. 24. 51,18	10. 25,98	10. 26,14
0	133. 10	4. 20,0	28,8	23,5	25,5	26,2	28,5	- 3,2	133. 14. 24,88	10. 26,30	10. 25,76
30	133. 20	4. 44,3	54,4	49,6	50,9	51,6	53,3	- 3,5	133. 24. 50,10	10. 25,22	

The temperature at 6<sup>h</sup> was 42°,1 and at 7<sup>3h</sup><sub>4</sub>, 38°,5. It is evident from the gradual diminution of the circle readings, that the apparent altitude of the spire was increasing by a change of refraction during the observations. The differences are consequently alternately greater and less than the true value. By taking the means of consecutive differences this source of error must be very nearly eliminated. The corrections for runs, the amount of which was found immediately after the above observations to be + 3'',6 for 5', are applied on a principle which will be shortly explained. The mean of the four determinations is 10'.26'',205, and the value of one revolution is therefore 20'',873.

The correction to the meridian for curvature of path is obtained for Polaris and  $\delta$  Ursæ Minoris by converting the time by Molyneux in column 10 into time by Hardy, by means of comparisons given below the columns of the left-hand pages, and thence inferring the true sidereal time from the error of Hardy given by the transit observations. The correction is then immediately deduced from the difference of this time and the time of meridian passage given in the Nautical Almanac, by means of tables especially calculated for these two stars. For other stars, the calculation is performed by a formula, easily investigated, according to which, the correction for a given distance from the middle wire varies as the tangent of declination, and for a given declination varies as the square of the distance. When the declination is 45°, the correction for the interval from the middle wire traversed by an equatoreal star in 16°,6, which is the mean interval of the wires, is 0'',1503. For small declinations this correction is omitted as being too inconsiderable. With respect to the sign of the correction it is to be observed, that in looking directly at an object between the pole and the equator, the telescope is turned by reason of the curvature of path too far in the direction in which the graduation proceeds. The circle reading is consequently too small, and the correction is positive. The contrary is the case below the equator and below the pole. In reflexion observations, the error of position of the telescope is in the opposite direction, and the sign of the correction is always contrary to what it is in observing directly the same objects.

The correction for change of N.P.D. is calculated in the case of the Sun and Planets, by inferring the change in the time between the instant of observation and the passage across the middle wire, from the horary variation given in the Nautical Almanac. This time is estimated by intervals and parts of an interval between the wires, taking each interval equal to 16°,6  $\times$  sec. of declination. In observations of the Moon, an exact value of the time of passing from one wire to the next is requisite, on account of the rapid change of her N.P.D. The value employed is 16°,6, multiplied by the factor used for correcting to the mean of all the wires in imperfect transit observations of the Moon, the expression for which is given p. iii. The required correction is then inferred from the variation of the Moon's N.P.D. in 10<sup>m</sup>, given in the Nautical Almanac. The sign of the correction for change of N.P.D. is determined by considering, that when the N.P.D. of the moving body is increasing, before



The observations are divided into groups, severally containing stars proper for giving clock errors. The groups are separated by intervals during which no observations have been taken, and which, as often as possible, belong to consecutive nights. The mean of the clock errors in each group is considered to apply to the mean of the times of transit of the stars which furnish them. The comparison of this mean error with errors similarly derived from the next preceding and following groups, gives a preceding and a following rate; whence a rate is inferred which is assumed to hold uniformly throughout the middle group. No definite rule can be given for inferring the adopted rate: attention is paid to the probable degree of accuracy with which the rates it depends on are determined, and also to the proportion of the intervals separating the preceding and following mean clock errors from the intermediate one. The adopted rate, which is put in the *seventh column*, is employed, first, in deducing from the mean clock error of the group to which it applies, the clock errors at all the times the clock shewed 0<sup>h</sup> in the interval between the limits of the group, which errors are arranged in the *eighth column*; and then in finding the additional correction for the interval between each transit and the next preceding 0<sup>h</sup>. Bars are placed across the seventh and eighth columns to indicate the limits of the groups to which the successive determinations of clock rate are applied.

The apparent right ascensions of the *ninth column* are formed by adding the two parts of the correction for clock error to the corrected times of transit contained in the fourth column. It should be observed, that the apparent right ascensions of Polaris and  $\delta$  Ursæ Minoris cannot be considered as independent determinations, excepting where the meridian error is known by consecutive transits of one of these stars: nor can those of the fundamental stars be considered in any degree as such, unless three at least are contained in the same group.

The *Apparent Right Ascensions of Polaris and  $\delta$  Ursæ Minoris*, (pages 86 and 87) are merely extracted from the columns of Calculated Apparent Right Ascensions: and the *Mean Right Ascensions, Jan. 1, 1839, of these Stars* (in the same pages) are formed by subtracting the corrections for aberration, precession and nutation, from the Apparent Right Ascensions. The *Mean Right Ascensions, Jan. 1, 1839, of Stars observed in the year 1839*, (pages 88—95) are formed in the same manner. The observations of Polaris and  $\delta$  Ursæ Minoris being in almost every instance independent, and those observations of clock-stars which were not independent, being employed in the reduction of observations of the Sun, Moon, and Planets, it was not thought worth while to exclude any from the lists of Mean Right Ascensions.

For Stars whose apparent right ascensions are calculated in the Nautical Almanac, the requisite corrections are found by subtracting the mean from the apparent right ascensions of that work, the latter in the instances of Polaris and  $\delta$  Ursæ Minoris being affected with the corrections depending on the Moon's longitude. For stars in the Royal Astronomical Society's Catalogue, not included in the list of the Nautical Almanac, the corrections are calculated by the formula  $Aa + Bb + Cc + Dd$ ;  $\log A$ ,  $\log B$ ,  $\log C$ , and  $\log D$  being taken from the Nautical Almanac without alteration, and  $\log a$ ,  $\log b$ ,  $\log c$ ,  $\log d$  from the Astronomical Society's Catalogue. For stars not included in that Catalogue, the corrections are calculated by the following formula, depending on the expressions for  $a$ ,  $b$ ,  $c$ ,  $d$ , given in p. xvii. of the Preface to the Catalogue:

$$\begin{aligned} \text{Correction} = & \frac{A}{15} \cos R. \operatorname{cosec} N.P.D. + \frac{B}{15} \sin R. \operatorname{cosec} N.P.D. + C \times (n^0 \log = 0,4869) \\ & + \frac{C}{15} \times (n^0 \log = 1,3020) \times \sin R. \cotan N.P.D. + \frac{D}{15} \cos R. \cotan N.P.D. \end{aligned}$$



The *Catalogue* in pages 96 and 97 contains the mean R.A. of each star concluded from all the preceding values of its mean R.A. The *Annual Variations* are taken either from the Nautical Almanac, or from the Astronomical Society's Catalogue, or are computed by the formula used in the latter work.

## II. *Observations with the Mural Circle and Calculation of Geocentric North Polar Distances.*

The particulars of observations with the Mural Circle, and the Calculations of Geocentric North Polar Distances, are recorded in pages 100—179. The left-hand pages contain the pointer and microscope readings, with those corrections only that are required for finding the concluded circle readings: the right-hand pages exhibit, first, the apparent Zenith Distances, as deduced from the concluded circle readings, and then the Geocentric North Polar Distances of the fixed stars and centres of the moving bodies, together with the elements of the Calculations by which the latter are derived from the Apparent Zenith Distances. The following is the explanation of the contents of the separate columns.

The *first column* has the day of observation, commencing always with the Sun's passage.

The *second column* contains the name of the object observed, with letters indicating the method of observation. *R* denotes that it is observed by reflexion: *M* that it is observed with the micrometer wire. When the limb of a planet is mentioned, it is that observed with the fixed wire. The Stars are named according to the rule adopted with respect to the Transit observations. Anonymous stars are designated by their approximate right ascensions, which may be inaccurate 2 or 3 seconds.

For understanding the explanations that follow it must be observed that the order of the six microscopes, beginning with *A*, which is at the northern extremity of the horizontal diameter of the circle, and proceeding over the highest part of the limb, is *ACEBDF*, so that *A* and *B*, *C* and *D*, *E* and *F*, are severally at the ends of a diameter. Also, that all micrometer readings increase as the micrometer wires move *towards* the graduated micrometer-heads. The microscopes have their micrometer-heads all directed the same way relatively to the graduation of the circle: that of *A* is *downwards*. When the Telescope is horizontal and its object-glass looks southward, the micrometer-head of the eye-piece micrometer is also downwards.

The *third column* gives the indication of the pointer. The divisions of the circle are 5' apart, and the pointer is placed *below* microscope *A* at an interval of 10°. 45' nearly from the zero of its reading. The graduation proceeds in the direction from the microscope to the pointer, and the pointer reading in column 3 is the degrees and minutes of that division which, in the order of graduation, comes next *before* the position of the pointer. This, as first set down, is sometimes erroneous by some multiple of 5'; but as the error is readily detected in the computations, no notice is taken of it in the notes.

The *six succeeding columns* contain the readings of the six microscopes. The minutes which are set down in the first of these columns, are indicated by the number of indents of the comb of the microscope in the interval between the division bisected by the micrometer wire and the hole of the comb; and the seconds and fraction of a second are taken from the micrometer head. The bisected division is that next to the hole, on the side, as seen in the microscope, of the micrometer-head, (excepting in some instances mentioned hereafter), and as the direction of the micrometer-head from the comb is that in which the graduation proceeds, the microscope reading of *A* is equal to the arc between the division which gives the pointer reading of column 3, and a certain fixed point distant exactly 10°. 45' from the zero of the microscope reading. Consequently the microscope reading *added* to the pointer reading is an arc of the circle, commencing with the zero

Time of Observation 1839.	Micrometer Reading		Meridian Error by Cross.	Adopted Meridian Error.	Remarks.
	for true line of Collimation.	for bisection of Cross.			
Jan. 2. $2\frac{1}{2}$	24,245	23,264	+ 2",18	+ 2",39	{ Just after the reversion. Illuminated End of Axis East.
23. 3	24,309	23,279	+ 3,02	} + 2,74 {	Illuminated End of Axis East.
...	24,309	25,343	+ 3,09		..... West.
...	24,323	25,343	+ 2,85		..... West.
...	24,323	23,311	+ 2,71		..... East.
Feb. 4. 23	23,302	23,205	+ 4,16	+ 2,68	The cross was indistinct.
16. 4	24,310	23,348	+ 1,86	+ 1,83	Cross clear and steady.
March 2. 3	24,325	23,304	+ 2,87	+ 2,30	Cross clear and very steady.
16. 2	24,300	23,304	+ 2,44	+ 4,06	
28. 5	24,299	23,302	+ 2,46	+ 4,29	
April 9. 4	24,311	23,253	+ 3,50	+ 3,13	{ Just before the reversion. Just after the reversion.
4	24,311	25,253	+ 1,52	+ 2,30	{ Illuminated End of Axis West.
May 30. 8	24,320	25,230	+ 0,97	+ 1,08	{ Just before the reversion. Just after the reversion. Illuminated End of Axis East.
June 6. 7	24,301	25,219	+ 1,11	+ 0,69	
7	24,301	23,395	+ 0,90	- 0,48	
July 3. 5	24,283	23,438	- 0,14	- 0,81	The cross was extremely unsteady.
Aug. 12. 3	24,280	23,375	+ 0,89	+ 1,80	
Sept. 7. 2	24,282	23,386	+ 0,73	+ 1,18*	
19. 3	24,314	23,394	+ 1,14	+ 0,37	{ Before the reversion. After the reversion.
3	24,314	25,270	+ 1,76	+ 1,07	{ Illuminated End of Axis West.
1840. Jan. 9. 23	24,342	25,588	+ 6,70	+ 6,83	{ Just before a reversion of the in- strument.

\* This value was adopted from an erroneous calculation of the meridian error given by the bisection of the cross. The value + 0",85 given by  $\delta$  Ursæ Minoris Sept. 1—3, should have been continued.

At each bisection of the cross the coincidence reading of the micrometer-wire with *D* was observed, and thence the change of coincidence reading since the previous reversion was inferred. The *micrometer reading* for the true line of collimation was supposed to undergo the same change, and was calculated accordingly, while the error of collimation is assumed to be constant from one reversion to the next. The meridian errors in the fourth column of the above Table were calculated by converting the *difference* of the micrometer readings of the two preceding columns into arc (by multiplying by 17",06) and subtracting algebraically 14",56 from the result, the sign of the meridian error being the same as that of the remainder. The adopted meridian errors are determinations by stars, and are in no instance very different from those by the cross. The above measures agree with those of 1838 in making the meridian error a *minimum* in July.

The *second column* of the right-hand pages contains the seconds, corrected for errors of collimation and level, of all the transits used in determining meridian error.

The meridian error in seconds of space is placed in the *third column*, with bars across to indicate the limits within which each value is used. The methods by which the values are severally obtained, are stated at the bottom of the page.

The correction in seconds of time applied to each transit is

$$\frac{1}{15} \times \text{meridian error} \times \sin \text{Zen. Dist.} \times \text{cosec } N.P.D.,$$



the zenith distance being negative when north of the zenith, and the north polar distance negative when north of the pole.

The seconds of each transit, corrected for the three errors of collimation, level, and azimuth, are arranged in the *fourth column*. The numbers for the Sun, Mars, Jupiter, and Saturn, when both limbs have been observed, apply to their centers, the mean of the uncorrected transits of the two limbs having been corrected in the same manner as other transits.

*Clock Error.*—The *fifth column* contains the seconds of the assumed apparent right ascensions of the stars used for determining clock error. Among these Polaris and  $\delta$  Ursæ Minoris are always included, not as being used for clock error, but because their apparent right ascensions are sometimes employed for finding the meridian error, and may in any case give the means of judging of the position of the instrument. The Assumed Mean Right Ascensions, Jan. 1, 1839, of the fundamental stars and of the two just mentioned, are as follows:

Star's Name.	Assumed Mean R.A. Jan. 1, 1839.	Excess over Naut. Alm. 1839.	Star's Name.	Assumed Mean R.A. Jan. 1, 1839.	Excess over Naut. Alm. 1839.
	<i>h. m. s.</i>	<i>s.</i>		<i>h. m. s.</i>	<i>s.</i>
$\alpha$ Andromedæ...	0. 0. 4,71	+ 0,06	$\epsilon$ Bootis. ....	14. 37. 57,37	- 0,01
Polaris .....	1. 1. 54,07	- 0,22	$\alpha^2$ Libræ.....	14. 41. 59,06	- 0,08
$\alpha$ Arietis.....	1. 58. 6,72	+ 0,12	$\alpha$ Coronæ Bor...	15. 27. 52,40	+ 0,06
$\alpha$ Ceti. ....	2. 53. 52,27	+ 0,05	$\alpha$ Serpentis.....	15. 36. 20,61	+ 0,11
Aldebaran .....	4. 26. 41,37	+ 0,02	$\delta$ Ophiuchi.....	16. 5. 54,81	- 0,09
Rigel.....	5. 6. 48,24	+ 0,03	Antares. ....	16. 19. 32,98	+ 0,15
$\beta$ Tauri .....	5. 16. 7,14	- 0,04	$\alpha$ Herculis .....	17. 7. 18,58	+ 0,02
$\alpha$ Orionis.....	5. 46. 27,48	+ 0,01	$\alpha$ Ophiuchi .....	17. 27. 27,84	+ 0,05
Castor .....	7. 24. 19,04	- 0,17	$\delta$ Ursæ Minoris.	18. 24. 14,86	- 0,82
Procyon .....	7. 30. 52,22	- 0,16	$\alpha$ Aquilæ.....	19. 42. 55,70	+ 0,01
Pollux .....	7. 35. 27,29	- 0,10	$\beta$ Aquilæ.....	19. 47. 24,33	+ 0,00
$\alpha$ Hydræ.....	9. 19. 40,59	- 0,03	$\alpha^2$ Capricorni....	20. 9. 7,07	+ 0,06
Regulus .....	9. 59. 47,51	- 0,20	$\beta$ Aquarii. ....	21. 23. 4,85	+ 0,10
$\beta$ Leonis.....	11. 40. 50,59	- 0,05	$\alpha$ Aquarii.....	21. 57. 30,87	+ 0,03
Spica.....	13. 16. 43,25	+ 0,04	$\alpha$ Pegasi.....	22. 56. 44,78	+ 0,01
Arcturus.....	14. 8. 19,27	+ 0,04			

The above right ascensions were obtained by adding the annual variations to the mean Right Ascensions Jan. 1, 1838 concluded from the *Cambridge Observations* of 1838, and given in pages 114 and 115 of the Volume for that year. The mean excess of the above assumed R.A. (excluding those of Polaris and  $\delta$  Ursæ Minoris) above the R.A. of the same stars in the Nautical Almanac is +0<sup>s</sup>.001. The observations of the present Volume are consequently referred to the same place of the equinox very nearly as those of 1838.

To form the numbers of the fifth column, the excesses over the Nautical Almanac 1839 in the above table, are added to the seconds of the apparent R.A. given in that work. It will be seen that the corrections which are thus adopted for aberration, precession, and nutation, are the same as those of the Nautical Almanac, where, in accordance with what is said in the Preface to the Astronomical Society's Catalogue, (pp. x. xiii. and xiv.) the constant of aberration = 20<sup>''</sup>.36, and that of lunar nutation = 9<sup>''</sup>.25. For Polaris and  $\delta$  Ursæ Minoris the additional corrections are applied, depending on the Moon's longitude, which are given in pages 478 and 479 of the Nautical Almanac for 1839.

The clock errors of the *sixth column* are the excesses of the tabular apparent right ascensions (altered as just stated) above the corrected times of transit.

The correction applied to each transit for clock error consists of two parts, the error at the preceding 0<sup>h</sup> of the clock, and the increase of error by the clock's rate in the interval between 0<sup>h</sup> and the time of transit. These are calculated in the following manner.

it passes the middle wire the telescope is advanced too far in the direction of the circle's graduation, and after passing, too far in the contrary direction. The circle reading requires a *plus* correction in the first case, and a *minus* correction in the other. If the N.P.D. is decreasing, the signs of the corrections are the contrary.

When both limbs of the Moon are observed at the same transit, a correction is applied, if of sensible amount, to one of them for defect of illumination. The correction is positive or negative according as the S. or N. Limb is deficient. The only observations of both limbs in 1839 were on July 22, Aug. 24, and Sept. 22. By using a celestial globe in the manner indicated at p. xxxi of the Introduction of the Cambridge Observations of 1835, it was found that the corrections on the two first days were quite insensible, and on the other the amount was only 0",20. On Sept. 29, a deficient limb was observed by mistake, and the correction applied was calculated by the rule given at p. xli of the Introduction of the Volume for 1838.

The microscope readings obtained in the manner stated p. xiii, are affected with an error of *Runs*, unless the micrometer wire is carried by five turns of the micrometer exactly from the image of one division to that of the next, which can very rarely happen. On this account a correction is applied to every microscope reading, the amount of which is derived from observations made from time to time, especially after considerable changes of temperature, in the following manner. The circle is clamped in such a position, that a division is near the zero of the microscope on the *negative* side, or that removed from the micrometer head; and this division with the adjacent one on the *positive* side of zero, is bisected. The excess of the micrometer reading for the latter above the micrometer reading for the other, with sign changed, is the quantity to be added to a micrometer reading of 5', to correct for the inequality in question. For a less reading the correction is proportionally less. Instead of correcting for each microscope reading separately, it is sufficiently accurate and more expeditious, to add the excesses of the six microscopes together, to take a part of the sum with sign changed, bearing the same ratio to the whole as the approximate mean microscope reading to 5', and then adding up this part with the six microscope readings, to divide the sum by 6 to obtain the corrected mean reading. The sum of the excesses with sign changed, is the "Correction for Runs" at the bottom of the right-hand pages, where also the times of commencing a new value are stated. The dates of the observations for the amount of runs are given on the opposite pages.

It sometimes happens in an observation, that a division falls so near the zero of the microscope that it is uncertain whether it be on the negative or positive side. In such a case it is always bisected, and should it afterwards be found to be on the negative side, the pointer reading and minutes of the microscope readings are put down for the sake of uniformity as if the division on the positive side had been bisected, but no correction, or a small negative one, is applied for runs. When this circumstance occurs it is mentioned in the notes.



The following Table exhibits the results of the observations made in 1839 for the error of Runs of the six microscopes. Before each observation the Circle was clamped in the position it happened to have at the time.

Day of Observation 1839.	Excess of micrometer-reading for positive division above micrometer-reading for negative division, for each microscope.						Sum of Excesses.	Day of Observation 1839.	Excess of micrometer-reading for positive division above micrometer reading for negative division, for each microscope.						Sum of Excesses.
	A	B	C	D	E	F			A	B	C	D	E	F	
Jan. 8	+0,8	+2,2	-0,1	-2,1	+1,7	-3,9	-1,4	July 3†	+2,5	+1,9	+1,7	-1,1	+1,1	0,0	+6,1
24	+1,2	+2,4	+0,6	-1,6	+0,6	-4,2	-1,0	17	+1,5	+1,6	+1,0	-1,2	+2,1	+0,1	+5,1
Feb. 25	+0,8	+0,4	+0,1	-1,8	+2,0	-4,8	-3,3	Aug. 2	+1,5	+2,9	+1,0	-0,5	+1,9	+0,7	+7,5
Mar. 11	+0,1	+1,9	-0,5	-1,4	+2,4	-4,4	-1,9	13	+2,0	+2,6	+0,8	-0,9	+2,7	+1,0	+8,2
20	+0,7	+0,1	+0,3	-1,5	+2,8	-3,8	-1,4	23	+2,5	+0,1	+1,6	+0,1	+3,3	+0,9	+8,5
26*	+0,9	+1,5	+0,8	-1,0	+1,8	-3,1	+0,9	Sept. 2	+1,6	+1,9	+0,9	-0,3	+2,2	+0,5	+6,8
Apr. 10	+1,0	+1,4	+0,6	-2,0	+1,6	-4,5	-1,9	10	+2,4	+2,4	+1,1	-1,1	+1,0	+1,2	+7,0
22	+0,3	+2,1	+0,8	-0,6	+2,2	-3,7	+1,1	18	+2,2	+0,9	+1,5	-0,3	+1,0	+1,1	+6,4
30	+1,1	+1,5	+1,1	-0,9	+3,3	-3,8	+2,3	25†	+1,9	+2,2	+1,0	-0,5	+2,9	+1,0	+8,5
May 7	+2,1	+1,8	0,0	-0,4	+3,1	-3,8	+2,8	25	+2,8	+1,7	+1,8	-0,5	+1,0	+1,2	+8,0
28*	+2,0	+2,8	+0,9	-0,3	+4,7	-3,6	+6,5	30	+1,9	+1,6	+0,2	-1,4	+1,1	+1,3	+4,7
28	+1,7	+1,6	+1,3	-1,5	+4,3	-3,9	+3,5	Oct. 9	+2,6	+2,4	+0,5	-0,1	+2,7	+1,1	+9,2
June 5	+1,5	+1,3	+0,8	-0,9	+3,5	-2,8	+3,4	16	+1,9	+1,4	+0,7	-0,9	+1,0	+1,0	+5,1
11	+2,7	+2,3	+1,1	-1,1	+3,1	-3,1	+5,0	25	+1,0	+1,9	+0,6	-0,9	+2,3	+0,6	+5,5
16	+1,1	+1,7	+1,1	-1,0	+3,6	-3,0	+3,5	Nov. 11	+0,5	+1,7	-0,4	-1,3	+0,9	+1,0	+2,4
25	+1,4	+1,9	+0,9	-1,6	+3,3	-3,8	+2,1	19	+1,7	+1,8	+0,1	-0,5	-0,1	+1,0	+4,0
								Dec. 16	+1,3	+0,8	0,0	-1,7	0,0	-0,5	-0,1

\* The observation of March 26, and the first of May 28, were made soon after the Sun had been shining on the instrument.  
† On July 1, the Runs of the microscopes E and F were diminished by adjusting their object-glasses.  
‡ The two observations of Sept. 25 were taken in different positions of the circle, and the mean of the two results is used.  
|| The thermometer was at 63°, a great increase of temperature having occurred.

The concluded circle reading in the *twelfth column* is the mean of the microscope readings with all the above corrections applied. It is, therefore, the reading of the circle, supposing the microscopes to be in accurate adjustment for runs, and the object to have been observed with the fixed wire as it passed the middle vertical wire. For Polaris and  $\delta$  Ursæ Minoris the concluded reading applies to the time of meridian passage.

The *thirteenth column* contains the initial of the observer's name. The observations marked *C* are by myself, and those marked *G* by Mr Glaisher.

The mean between the two concluded readings of the reflexion and direct observations of the same star, is the reading corresponding to one or the other horizontal position of the telescope, and, increased or diminished, as the position may require, by 90°, gives the reading when the telescope is vertical and object-glass upwards. The readings thus determined, which for shortness are called "zenith points," are placed in the *first column* of the *right-hand* page. As the zenith points are found to be discordant with each other, a mean zenith point is adopted for forming the zenith distances of all observations included within certain limits, and is placed, with the date of its commencement, at the bottom of the page. The adopted zenith point has been deduced from the several zenith points of the series to which it applies, by a rule differing in some respects from that employed in preceding Volumes. The stars observed by reflexion and directly are divided into three groups, one comprehending stars near the zenith, and the other comprehending the stars far from the zenith, north and south respectively, the groups containing, as far



as is practicable, each the same number of zenith points. The mean of the zenith points given by each group is considered to apply to the mean of the corresponding zenith distances, and from the three results the zenith point corresponding to a zenith distance of  $0^\circ$  is calculated by interpolation. This is the adopted zenith point. It differs in general very little from the mean of the zenith points of the middle group. If there were no cause of discordance the zenith points determined by observations at different zenith distances would all be the same; and consequently the differences between the adopted zenith point and the other zenith points, are measures of the discordance at different zenith distances from whatever cause it may arise, and furnish the means of correcting for it, as will be shewn further on.\*

The limits between which the same adopted zenith point is used, include all observations in the course of which no considerable variation of the separate zenith points, distinct from the discordance above mentioned, can be recognized. Usually they are determined by changes arising from instrumental adjustments: but it also happens that gradual changes from unknown causes make the adoption of a new zenith point necessary. Every known cause of a change is mentioned where it occurs.

The *second column* contains the apparent zenith distance. This, or its supplement, according as the observation is direct or by reflexion, is obtained by subtracting algebraically the adopted zenith point from the circle reading of column 12, left-hand page, and, if the remainder be greater than  $180^\circ$ , adding to it when negative and subtracting from it when positive,  $360^\circ$ . The object is south or north of the zenith according as the result is in either case positive or negative.

The four next columns contain the materials for the calculation of *refraction*. The *third column* has the height of the barometer, as shewn by a cistern-barometer constructed by Dollond, and attached to the circle pier. The lower surface of the mercury is raised by a screw pressing the bag till the light seen below a brass edge is excluded; and a brass slider is brought to the upper surface to shut out the light in the same way. The *fourth column* has the reading of the thermometer whose bulb is plunged in the cistern of the barometer.

As it appeared by a comparison of this with six other barometers, (the particulars of which are given in the Volume for 1835, p. xxxi.) that its readings were too small by 0.1 inch nearly, the height immediately read from the barometer, which is that recorded in column 3, has always been increased by that quantity in calculating the refraction.

The *fifth column* has the mean of the readings of the two free thermometers. These thermometers are carried by jointed arms attached to the top of the pier, one at the North the other at the South end, and are nearly on a level with the upper limb of the circle. Precautions have been taken to ensure the free passage of air by the thermometer bulbs, and to protect them from radiation. When the Sun is near the meridian, the thermometers are turned from its rays by means of the jointed arms. All but the lowest shutters of the circle-room are kept open before and during observations, except when it is occasionally necessary for obtaining reflexion observations to close them partially a few minutes, on account of the disturbance of the mercury by the wind. Thus there is generally a strong current of air past the thermometers; and as the observing lamps are removed from the room when not in use, it may be presumed that the interior temperature is very little different from the exterior†.

\* The reason this method has been preferred to that of former years is, that in taking the means of results from the three groups, according to the latter method, we do not necessarily obtain a zenith point corresponding to a *fixed* direction, and may therefore have a different measure of discordance for every different adopted zenith point.

† See Introduction to Volume for 1835, p. xxxiii.



The refraction in the *sixth column* is calculated by Bessel's tables, (*Tabulæ Regiomontanæ*, p. 538, &c.) by making use of the Appendix to the *Greenwich Observations* of 1836. In this mode of calculation the reading of the attached is supposed to be the same as that of the free thermometer. The former reading, though not made use of, is inserted in the printed columns, to furnish the means of correcting, if required, for the error of this supposition.

The *seventh column* contains the parallax. If  $r$  and  $D$  be respectively the lines from the centre of the Earth to the place of observation and object observed,  $z$  the angle they make with each other,  $r'$  the Earth's equatoreal radius,  $D'$  the mean distance of the Sun from the Earth, and  $p$  the parallax, then the formula used for the Sun's limbs and for the planets is,

$$p = \frac{r}{r'} \times \frac{r'}{D'} \times \frac{D'}{D} \times \sin z.$$

$\text{Log } \frac{r}{r'}$  is taken = 9,9990916, which supposes the ratio of the Earth's axes to be that of 297 to 298;  $\text{log } \frac{r'}{D'} = 0,9333607$ , the assumed value of the Sun's equatoreal horizontal parallax at the mean distance being  $8'',5776$ ;  $\text{log } \frac{D'}{D}$  is the arithmetical complement of the log of distance given in the Nautical Almanac; and  $z$  is found by subtracting  $11'.12''$ , the angle of the vertical given by the above ratio of the axes, from the observed zenith distance.

The formula used for computing the parallax of the Moon's limbs is

$$\sin p = \frac{r}{r'} \sin (P + a) \sin z,$$

where  $P$  is the equatoreal horizontal parallax, which is interpolated with second differences from the Nautical Almanac, and  $a$  is a small correction introduced by finding exactly the parallax of the limb, that is, the angle made by a tangent to the highest or lowest point of the Moon's surface, as seen from the place of observation, with a tangent to the highest or lowest point, as seen from the Earth's centre. In using the above formula, the sine is not considered equal to the arc. The other elements of the calculation are the same as for the planets.

For the calculation of  $a$ , which is dependent on the zenith distance, I must refer to the *Cambridge Observations*, Vol. IV., for 1831, p. 147. The following is a table of its values, for the North and South Limbs, and for different zenith distances.

Zenith Distance.	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°
Corr. for N.L.	-0,03	-0,04	-0,05	-0,06	-0,06	-0,07	-0,08	-0,08	-0,09	-0,09	-0,09
Corr. for S.L.	+0,10	+0,11	+0,12	+0,12	+0,13	+0,14	+0,15	+0,15	+0,16	+0,16	+0,16

The *eighth column* contains the micrometer reading, when one limb of a planet is observed with the micrometer wire, and the other on the fixed wire.

The *ninth column* contains the semidiameters of the Sun and Moon, and those of the planets whenever they are not observed by bisecting their centres. The Sun's semidiameter is taken from pages II of the Nautical Almanac: the Moon's is interpolated with second differences from the Nautical Almanac. The apparent diameters of Mars, Jupiter, and Saturn in the vertical direction, are given by the micrometer readings of column 8, treated

in the same manner as those on the left-hand page, and the semidiameters of column 9 are found by merely halving the results.

For Venus the micrometer reading of column 8 gives the difference of N.P.D. of the N. or S. limb and the extreme illumined point of the opposite limb, whence the semidiameter is deduced in the manner following. From the spherical triangle which has its angles at  $P$  the pole of the equator,  $V$  the geocentric place of Venus, and  $S$  the geocentric place of the Sun, at the time of observation, the angle ( $\theta$ ) made by the line joining the extreme illumined points of the planet's periphery with the circle of declination through her centre is first derived, this angle being equal to the difference of  $\angle PVS$  and  $90^\circ$ .\* Then,  $\Delta$  being the above mentioned difference of N.P.D. converted into arc, if Venus is horned, semidiameter  $= \frac{\Delta}{2} \sec^2 \frac{\theta}{2}$ . But if Venus be gibbous, which was the case from the beginning of the year to July 15, the semidiameter is calculated by the following formulæ:

$$\sin \theta' = \frac{R}{r} \sin SV \sin \theta, \quad \text{Semidiameter} = \frac{\Delta}{2} \sec^2 \frac{\theta'}{2};$$

the logarithms of  $R$  and  $r$ , which are respectively the distances of the Earth and Venus from the Sun, being taken from the Nautical Almanac. The calculated semidiameter is set down in column 9. When it happens that the deficient limb is observed on the fixed wire, the value employed for deducing the N.P.D. of the centre, is this semidiameter diminished by the excess of the calculated above the measured diameter.

On March 26 and Dec. 22 the micrometer readings for the opposite limb of Venus were omitted by mistake, and on Sept. 23, 25, 30, and Oct. 3, the cusps were too sharp for satisfactory observation. The values of the semi-diameter used on these days were adopted on the following considerations. Let  $e$  be any excess of Venus's tabular diameter above the diameter given by observation, extracted from the table in p. 196. Let  $\Delta$  be the tabular diameter, and  $\Delta(1 - \epsilon)$  be the true diameter. Now if the diameter by observation be affected by a constant source of error which makes it too large by  $E$ , it will follow that  $e = \epsilon\Delta - E$ . By forming as many different equations as there are different values of  $e$  (viz. 74), and taking the means of the first half and the latter half, the two results are,  $-0''.841 = 11''.719\epsilon - E$ , and  $-1''.652 = 33''.351\epsilon - E$ . From these it will be found that  $E = +0''.40$ , and  $\epsilon = -0.0375$ . The tabular semidiameter at the unit of distance is  $8''.25$ . Hence by these observations *the true semidiameter of Venus at the unit of distance is  $8''.25(1 + 0.0375)$ , or  $8''.56$* . The value found by 78 observations in 1838 was  $8''.47$ . The mean of the two results is  $8''.52$ , which is used to obtain the semidiameters on the above-mentioned days, by multiplying by the arithmetical compliment of log. dist. taken from the Nautical Almanac.

The value of  $E$  derived from the observations of 1838, was  $+0''.94$ . The mean of the results of the two years is  $+0''.67$ . This error may possibly be owing to irradiation.

The geocentric N.P.D. of the centre in the *tenth column* is deduced from each observation by applying to the apparent zenith distance of column 2, the corrections for refraction, parallax, and semidiameter, and adding  $37^\circ.47'.8''.28$ , the assumed colatitude of the Observatory. (The negative sign denotes that the object, when observed, was below the pole.) The result is, therefore, the N.P.D. of the centre of the object as viewed from the Earth's centre, at the time of passing the middle wire, affected by uncorrected instrumental errors and errors of observation, as also by any errors in the assumed values of the constants employed in the calculations.

The pages immediately following those whose contents have now been explained, contain as follows:

\* If  $PQ$  be perpendicular to the arc of a great circle through  $S$  and  $V$ ,  $\sin PVS = \frac{\sin PQ}{\sin PV}$ . By this formula  $\angle PVS$  was calculated,  $PQ$  being first measured by the Meridian Circle of a Celestial Globe, after bringing  $S$  and  $V$  to the Horizontal Circle. At the same time  $SV$ , when required to be known, was measured by the Horizontal Circle.



1°. *Mean North Polar Distances of Stars observed in 1839, as deduced from each day's observation*, in pages 182—198. These mean N.P.D. are referred to the beginning of the year, and are deduced from the apparent N.P.D. in column 10, right-hand page, of the *Zenith Distances observed*, &c., by applying corrections obtained by the following methods. For stars included in the list of the Nautical Almanac, the corrections added to the apparent N.P.D., are found by subtracting the mean declinations (Jan. 1, 1839) in that work, from the apparent declinations derived from the same work by interpolating for the times of observation. For Stars not in the Nautical Almanac, but included in the Catalogue of the Royal Astronomical Society, the corrections added to the apparent N.P.D. are calculated by the formula,  $Aa' + Bb' + Cc' + Dd'$ .  $\log A$ ,  $\log B$ ,  $\log C$ ,  $\log D$ , are taken from the Nautical Almanac; and  $\log a'$ ,  $\log b'$ ,  $\log c'$ ,  $\log d'$ , from the Society's Catalogue. For stars not in that Catalogue, the corrections (also added to the apparent N.P.D.) are calculated by the following formula, depending on the expressions for  $a'$ ,  $b'$ ,  $c'$ ,  $d'$ , given in p. xvii. of the Preface:

$$\begin{aligned} \text{Correction} = & A \times (N^\circ. \log = 9,6375) \times \sin N.P.D. - A \cdot \sin R \cos N.P.D. \\ & + B \cos R \cos N.P.D. + C \times (N^\circ. \log = 1,3020) \cos R - D \sin R. \end{aligned}$$

Where the resulting mean N.P.D. is included in brackets, no use is made of it in deducing the concluded mean.

The results by the same star, when observed above and when below the pole, are arranged separately to serve for correcting the assumed colatitude. Also, the results by direct observations are separated from those by reflexion observations of the same star, for the purpose of exhibiting the effect of the discordance of zenith points before spoken of, and furnishing data for applying a correction.

2°. *Catalogue of the Concluded Mean North Polar Distances, Jan. 1, 1839, with the Annual Variations*, in pages 191 and 192. The concluded mean is the mean (corrected as stated below) of all the preceding mean N.P.D.; and the annual variations are either taken from the Nautical Almanac, or are computed by the formula in the Astronomical Society's Catalogue. In performing the calculation, the mean R.A. Jan. 1, 1839, were made use of, and consequently the annual variations differ a little from those of the same stars in that Catalogue.

The corrections applied to the mean of all the different determinations of mean N.P.D., to obtain the concluded mean, are for error of assumed colatitude and for discordance of zenith points. The former correction is derived from a new determination of the colatitude of the Observatory, calculated from all the observations of the same stars above and below the pole which were made in the years 1836, 1837 and 1838. The calculation is given in pages liii—lviii of the Introduction to the Volume of 1838, and the result is, that the assumed colatitude  $37^\circ.47'.8'',28$  should be increased by  $+0''.09$ . This quantity is accordingly added algebraically to the mean N.P.D., considering them negative when the observations are below the pole.

The correction for discordance of zenith points is applied on the following principle. The discordance is of such a nature, that the circle reading for zenith point is in general less by a star observed south of the zenith than by a star observed north of the zenith. Apparently when the object-glass is to the south of zenith, the telescope, whether directed to the heavens or the trough of mercury, requires to be turned for bisecting an object, a little farther in the direction of the graduation, than if the cause of inequality did not exist; and when the object-glass is to the north of zenith, a little in the contrary direction. Whatever may be the cause of the discordance, the error it produces is corrected by reducing the different zenith points to the zenith point corresponding to a *given* zenith distance. Hence, if  $M$  be the zenith point adopted according to the rule explained in



page xviii, and  $Z$  the zenith point resulting from a particular double observation south of zenith,  $M-Z$  is the error of the circle reading in defect, both for the reflexion and the direct observation, supposing both to be equally affected by the inequality. By this quantity the N.P.D. is too small as determined by the direct observation, and too great as determined by the reflexion observation; so that the excess of the latter determination above the other is twice  $M-Z$ . These inferences apply to observations north of the zenith, by taking  $M-Z$  a negative quantity when  $Z$  is greater than  $M$ , and the N.P.D. negative when the star is observed below the pole. The following table exhibits for each star observed directly and by reflexion, the mean value of  $M-Z$ , derived from the lists in pages 182—190, by halving the algebraic excess of the mean of the N.P.D. by reflexion above the mean of the corresponding N.P.D. by direct vision.

*Mean excess for each Star of the Adopted Zenith Point above the Zenith Points given by Observation.*

Star's Name.	Zen. Dist.	No. of Obs.	Means of $M-Z$ .	Star's Name.	Zen. Dist.	No. of Obs.	Means of $M-Z$ .
$\gamma$ Ursæ Majoris SP.	-73. 11	3	+ 0,50	$\nu$ Persei.....	+ 10. 9	1	- 0,52
$\alpha$ Cassiopeiæ SP...	72. 8	2	- 0,25	$\alpha$ Lyræ.....	13. 35	15	+ 0,09
$\delta$ Ursæ Majoris SP.	69. 51	2	- 0,56	$\beta$ Lyræ.....	19. 2	6	+ 0,90
$\nu$ Ursæ Majoris SP.	67. 59	1	- 1,30	$\beta^2$ Lyræ.....	19. 3	2	+ 0,68
$\alpha$ Lynceis SP.....	66. 14	1	- 0,32	Castor .....	19. 59	5	+ 0,64
$\eta$ Draconis SP.....	65. 54	1	+ 0,66	$b$ Arietis .....	23. 38	1	+ 0,90
$\alpha$ Cephei SP.....	65. 53	1	+ 1,04	$\beta$ Tauri.....	23. 45	6	+ 0,43
$\alpha$ Ursæ Majoris SP.	65. 10	8	+ 0,19	Pollux .....	23. 48	3	+ 1,17
$\epsilon$ Cassiopeiæ SP....	64. 55	1	- 0,09	$\alpha$ Andromedæ.....	24. 1	5	+ 0,88
$\iota$ Cephei SP.....	62. 26	1	+ 0,23	$\epsilon$ Bootis.....	24. 27	3	+ 0,98
A.S.C. 552 SP.....	61. 44	2	- 1,17	$\alpha$ Coronæ Borealis.	24. 57	6	+ 0,51
$\delta$ Draconis SP.....	60. 25	1	+ 0,87	$\eta$ Tauri.....	28. 37	4	+ 0,49
55 Camelopardi SP.	58. 51	2	+ 0,07	$\alpha$ Arietis.....	29. 31	5	+ 0,36
$\beta$ Cephei SP.....	57. 56	1	+ 1,13	Arcturus .....	32. 11	11	+ 0,87
$\kappa$ Draconis SP.....	57. 6	3	- 0,38	$\eta$ Bootis.....	33. 0	7	- 0,11
$\beta$ Ursæ Minoris SP.	52. 58	3	+ 0,36	Aldebaran.....	36. 2	5	+ 0,51
$\zeta$ Ursæ Minoris SP.	49. 30	2	- 0,25	$\beta$ Leonis.....	36. 44	4	+ 0,57
$\delta$ Ursæ Minoris SP.	41. 12	2	- 0,15	$\alpha$ Herculis.....	37. 37	3	+ 1,18
Polaris SP.....	39. 20	24	- 0,42	$\alpha$ Pegasi .....	37. 53	6	+ 0,50
$\lambda$ Ursæ Minoris....	36. 36	7	- 0,58	$\gamma$ Pegasi .....	37. 56	3	+ 1,71
Polaris.....	36. 14	17	- 0,73	Regulus .....	39. 27	3	+ 0,92
$\delta$ Ursæ Minoris ....	34. 23	6	+ 0,05	$\alpha$ Ophiuchi .....	39. 32	4	+ 0,60
$\epsilon$ Ursæ Minoris ....	30. 5	6	- 0,74	$\gamma$ Aquilæ.....	41. 59	3	- 0,73
$\zeta$ Ursæ Minoris....	26. 4	3	- 1,15	$\alpha$ Aquilæ.....	43. 46	5	+ 0,04
$\gamma$ Cephei.....	24. 31	9	- 0,55	$\alpha$ Orionis.....	44. 51	1	+ 0,48
$\beta$ Ursæ Minoris....	22. 36	8	- 0,05	$\alpha$ Serpentis.....	45. 16	3	- 0,89
$\beta$ Cephei.....	17. 38	7	- 0,31	$\beta$ Aquilæ.....	46. 12	3	- 0,11
$\delta$ Draconis.....	15. 10	1	- 1,11	Procyon.....	46. 35	5	+ 0,49
A.S.C. 552.....	13. 51	1	- 0,14	$\alpha$ Ceti.....	48. 46	2	- 0,52
$\alpha$ Ursæ Majoris....	10. 25	15	- 0,48	$\gamma$ Ceti.....	49. 40	1	- 0,59
$\alpha$ Cephei .....	9. 41	12	- 0,19	$\delta$ Orionis.....	52. 38	4	- 0,23
$\eta$ Draconis.....	9. 40	1	+ 0,15	$\alpha$ Aquarii.....	53. 19	5	+ 0,81
$\alpha$ Cassiopeiæ.....	3. 26	10	- 0,63	$\epsilon$ Orionis .....	53. 32	1	- 0,38
$\iota$ Persei.....	2. 53	1	+ 2,05	$\beta$ Aquarii .....	58. 30	1	+ 1,16
$\gamma$ Ursæ Majoris ...	- 2. 23	11	- 0,11	38 Eridani.....	59. 29	1	+ 0,83
$\eta$ Ursæ Majoris ....	+ 2. 5	7	0,00	Spica .....	62. 32	5	+ 0,20
$\alpha$ Persei.....	2. 56	3	- 0,46	$\gamma^1$ Eridani.....	66. 11	1	+ 1,68
Capella. ....	6. 23	22	+ 0,30	$\beta$ Ceti .....	71. 5	1	+ 0,70
$\alpha$ Cygni.....	7. 31	14	+ 0,11				

From the preceding table, the one subjoined of corrections to be applied to N.P.D. observed directly, was deduced as follows. The above mean values of  $M-Z$  were divided into groups the limits of which, (indicated by the line across,) were chosen so that the stars of each group do not greatly differ in zenith distance. Each mean value in a group was multiplied by the number of observations by which it was determined, and the corresponding zenith distance by the same number. The sum of each series of products being divided by the whole number of observations in the group, the resulting value of  $M-Z$  was considered to belong to the resulting zenith distance. A line of abscissæ was then drawn on which these zenith distances were set off, and the corresponding values of  $M-Z$  being taken for ordinates, a curve was traced by hand among the points thus determined, so as to approach nearer to any point, the greater the number of observations by which its position was assigned. Ordinates of this curve were then measured at intervals of  $5^\circ$ , and the measures with the corresponding N.P.D. tabulated as follows, to serve for correcting by interpolation at any proposed N.P.D. From what has been already said, the sign of the correction for a direct observation is the same as that of  $M-Z$ , or the ordinate of the curve.

*Corrections for Discordance of Zenith Points, to be added algebraically to N.P.D. by direct Observations, 1839.*

N.P.D.	Correction.	N.P.D.	Correction.	N.P.D.	Correction.
$-40$	$-0,08$	$+15$	$-0,52$	$+70$	$+0,65$
$35$	$-0,03$	$20$	$-0,47$	$75$	$+0,47$
$30$	$+0,01$	$25$	$-0,41$	$80$	$+0,16$
$25$	$+0,03$	$30$	$-0,31$	$85$	$+0,06$
$20$	$+0,01$	$35$	$-0,20$	$90$	$+0,10$
$15$	$-0,07$	$40$	$-0,04$	$95$	$+0,24$
$10$	$-0,22$	$45$	$+0,16$	$100$	$+0,37$
$-5$	$-0,39$	$50$	$+0,37$	$105$	$+0,45$
$0$	$-0,49$	$55$	$+0,52$	$110$	$+0,50$
$+5$	$-0,52$	$60$	$+0,62$	$115$	$+0,52$
$+10$	$-0,53$	$+65$	$+0,67$	$+120$	$+0,52$

The corrections to N.P.D. obtained by reflexion observations are the same with contrary signs.

The interpolations for finding the corrections for proposed N.P.D. from the above table, were performed, whenever it appeared necessary, with second differences.

3°. *Sidereal Intervals occupied by transits of the Diameters of the Sun, Moon, Mars, Jupiter, and Saturn's Ring, from the Transit observations; and Vertical Diameters of the Sun, Moon, Mars, Venus, Jupiter, and Saturn, from the Circle observations, compared with the same from the Nautical Almanac, in pages 194—197.*

The Sidereal Intervals are the differences of the concluded transits of the first and second limbs over the mean of the seven wires, corrected in the case of the Moon, for the defect of illumination of one of the limbs by the quantities stated in the notes to the Transits. The rule by which this correction has been calculated (given in the Introduction of the Cambridge Observations of 1835, p. xv.) is to ascertain the Moon's distance in R.A. from the point of opposition to the Sun, and multiply this distance by the cosine of the Sun's declination, in order to obtain the length of the arc of a great circle drawn perpendicularly from the Sun's place on the meridian through the Moon's place. The required correction, to be added to the difference of the concluded transits, is then the versed sine of this arc on the Moon's surface.



The Vertical Diameters of the Sun and Moon by observation, are the differences of the zenith distances, corrected for refraction and parallax, of the North and South limbs, deficiency of illumination being allowed for in the case of the Moon, as explained in page xvi. Consequently they are true geocentric diameters, the effect of applying these corrections to the limbs being to reduce their places to those in which they would be seen from the Earth's centre. The Vertical Diameters of Venus, Jupiter, and Saturn were obtained by merely doubling the numbers in column 9, right-hand page of the *Zenith Distances*, &c.

The tabular intervals occupied by the transits of diameter, are taken, for the Sun, Moon, Mars, and Jupiter, from the Nautical Almanac. Those for Saturn's Ring are the intervals of transit of diameter derived from that work, and multiplied by 2,314, this being the tabular ratio\* of the axis major of the ring to the equatoreal diameter. The tabular vertical diameters of the Sun, Venus, Jupiter, and Saturn, are taken immediately from the Nautical Almanac: the Moon's is interpolated with second differences.

The differences between the observed and the tabular values of the intervals of transit and vertical diameters are exhibited for the purpose of obtaining corrections to the latter if required. In the instance of the Moon the tabular errors of the intervals of transit are converted into errors of diameter in arc by multiplying the former by  $15 \times$  the inverse of the factor, the expression for which is given in p. iii.

### III. *Right Ascensions and North Polar Distances of the Centres of the Sun, Moon, and Planets, observed in the year 1839, with the Greenwich Mean Solar Times of transit of centre.*

The concluded Right Ascensions and North Polar Distances of bodies of the Solar System, contained in pages 200—211, are deduced from their Apparent R.A. and Geocentric N.P.D. in the foregoing part of the work, by applying certain corrections, of which an explanation will now be given.

The corrections applied to the *Apparent Right Ascensions* are for reducing observations of limbs to observations of centres. The correction is different according as the Limb observed is the first or second, it being found, particularly in Mr Baldrey's observations, that while observations of first limbs agree well enough with observations of stars, second limbs are generally observed by a different kind of estimation. No corrections are required for the planets Vesta, Juno, Pallas, Ceres, and Uranus, which are observed as stars. It is to be understood that both limbs were observed unless one is mentioned under the head of *Limb observed*, and that in every instance both limbs of Jupiter and Saturn's Ring were observed.

When one Limb of the *Sun* is observed, the right ascension of centre is inferred from the observed R.A. of a *first* limb, by merely applying the sidereal time occupied by the transit of the semidiameter, as given in the Nautical Almanac. The additional correction applied to an observation of the *second* limb, for peculiar mode of observing, and the correction applied on the same account to the mean of the observed R.A. of the two limbs, are determined by the following considerations.

It appears by the comparison in pages 194 and 195 of the observed intervals occupied by the passage of the Sun's diameter across the meridian with the tabular intervals, that the mean excess of the former above the latter is  $+0^s,362$  by B's 105 observations, and  $-0^s,118$  by 16 observations of C and G. The former may be taken as applying to a mean declination of  $15^\circ$ , and the latter to a mean declination of  $8^\circ$  considering the portions of the year in which the observations were respectively made. Hence if we assume the Tabular Diameter to be correct†, the mean error of B's observations will be  $+0^s,350$ , and of C's  $-0^s,117$ .

\* See Nautical Almanac for 1839, p. 549.

† The mean excesses of the Tabular above the observed Diameter of the Sun by the Circle observations of 1836, 1837, 1838, and 1839 (excluding that of Dec. 21), are respectively  $-0'',12$ ,  $+0'',10$ ,  $-0'',16$ ,  $+0'',57$ . The mean of all is  $+0'',10$ .



By comparing the errors of the Sun's Tabular R.A. by C's observations from Jan. 29 to Feb. 16, and from Aug. 26 to Sept. 14, with an equal number of Tabular errors by B's observations made partly before and partly after those periods, the mean *excess* of the former above the latter was found to be  $+0^s,190$ . And the same observations by B (excluding that of Aug. 13) make the interval of transit of the Sun's diameter *greater* than the interval given by C's observations, by  $0^s,416$ . As this quantity is about double the other, it is extremely probable that the above-mentioned errors in the mean of B's and C's observed values of the interval, have their origin in observations of the second limb. Accordingly, when the Sun's R.A. is calculated from an observation of the second limb, it is corrected by  $-0^s,35$  in B's observations, and by  $+0^s,12$  in C's. When both limbs are observed half these corrections are applied.

The Right Ascension of the *Moon* at the time of transit of centre, is deduced from the observed R.A. of the limb by applying the sidereal time occupied by the transit of the semidiameter taken from the section of Moon-culminating stars in the Nautical Almanac, and increased by  $\frac{1}{15} \times 2^s,31 \times \text{sec. of Moon's declination}$ , it being found that the Moon's tabular semidiameter is  $2'',31$  in defect.

The observed R.A. of a *second* limb is corrected in B's observations by  $-0^s,30$ , and in C's by  $+0^s,12$ . The former quantity is very nearly the mean amount of discordance between B's observations of first and second limbs deduced from the transits of the Moon in 1839 in which both limbs were observed, after correcting for error of the Moon's tabular semi-diameter; and the latter is the same correction as that applied to C's observations of the Sun's 2 L. The correction  $+2'',31$  of the Moon's tabular semi-diameter is that which is obtained at p. lxvi of the Introduction to the Volume of 1838 from observations in 1837 and 1838. The meridian observations of both limbs in 1839, calculated in the same manner, give  $+2'',34$ . (See p. 195).

When one limb of a *Planet* is observed, the right ascension of centre is inferred from the apparent R.A. of limb, by applying the sidereal time occupied by the transit of semi-diameter, taken without alteration from the Nautical Almanac, excepting in the instance of Venus. For this planet the tabular value is *increased* by the fractional part  $0,032$ , in accordance with the result of the calculations in p. xx. Also to every observation by Mr Baldrey of a second limb a correction is applied for discordance in the observations of first and second limbs, assuming the latter only to be erroneous. The amount of correction for Mercury, Venus, and Jupiter, is  $-0^s,21$ ; for Mars  $-0^s,37$ ; and for Saturn's Ring  $-0^s,28$ . These values are adopted on the following considerations.

By circle observations the results of which are given in p. 197, the mean excess of the tabular vertical diameter of *Jupiter* above the vertical diameter from observation is  $-1'',02$ , which, multiplied by the ratio of the horizontal to the vertical diameter, becomes  $-1'',10$ . This mean applies nearly to June 3, when the declination of the planet was  $-20^{\circ}.10'$ , and its change of R.A. very slow. Hence, the error of the tabular interval of transit of diameter by these observations is  $-\frac{1}{15} \times 1^s,10 \times \text{sec } 20^{\circ}.10' = -0^s,073$ . But by the results of transit observations in p. 197 the mean error  $= -0^s,280$ . The difference  $0^s,207$  is due to a discordance in the observations of first and second limbs, supposing that if no such source of error existed the measure of the diameter would be the same by the transit as by the circle observations. As the whole difference is probably due to erroneous observation of the second limb, and as in every instance both limbs of Jupiter were observed, the correction applied to the apparent R.A. of centre is the half of  $-0^s,207$ , or  $-0^s,10$ .

In a similar manner for *Saturn*, the mean excess of the tabular vertical diameter above the diameter as observed with the circle, is  $-0'',965$ , by the Table of results in p. 197. Supposing the *same* difference to exist between the tabular and the observed horizontal diameter of the Ring, the error of the tabular interval of the transit of the Ring's diameter should be  $-\frac{1}{15} \times 0^s,965 \times \text{sec } 19^{\circ}.30' = -0^s,068$ , Saturn's mean declination being  $19^{\circ}.30'$ . But by the results of transit observations in the same table, this error is  $-0^s,345$ . The difference  $0^s,277$  is considered to be due to error in observing the second limb, and the consequent correction applied to the apparent R.A. of centre is  $-0^s,14$ .

The mean excess of the diameter of *Mars* measured by the circle micrometer above the tabular diameter, is  $2'',31$  by 24 observations; and by 5 observations of transits of the diameter corresponding to a mean

declination of  $7^{\circ}.41'$  the mean excess of the observed interval is  $0^s.526$ . (See p. 196). These two means correspond to nearly the same epoch. But by the circle observations the excess of interval of transit  $= \frac{1}{15} \times 2^s.31 \times \sec 7^{\circ}.41' = 0^s.155$ . The difference  $0^s.37$  is considered due to erroneous observation of the second limb, and consequently an apparent R.A. of centre deduced from an observation of the second limb has been corrected by  $-0^s.36$ , and when deduced from an observation of both limbs, by  $-0^s.18$ .

There being no means of ascertaining directly the errors committed in the observations of the second limbs of *Mercury* and *Venus*, the correction adopted for both these planets is  $-0^s.21$ , as being the least of those determined above.

The *North Polar Distance of Centre* from observation, is deduced from column 10 of the pages containing the *Calculation of Geocentric N.P.D.*, by correcting the N.P.D. of that column, or, in the instances of the Sun and Moon, the mean of the different values, for error of colatitude and discordance of zenith points. For the Moon there are also applied, the correction  $2''.31$  for error of semidiameter, small corrections for curvature of path omitted in the calculation of the concluded circle readings, and an additional correction, in every other instance insensible, for the position of the circle. The N.P.D. by the observation is that for the time of passing the middle wire; and as this time does not in general coincide with the meridian passage, a correction is required for the change of the Moon's N.P.D. in the interval. By transits of known stars observed with the circle and Molyneux, and referred by comparison of clocks to Hardy, the intervals between the meridian passage and the passage across the middle wire, were found for various polar distances, whence, by the intervention of graphical construction, the intervals corresponding to the Moon's N.P.D. at the times of observation were inferred. The variations of N.P.D. in these intervals were then calculated from the variations for  $10^m$  in the hourly ephemeris of the Nautical Almanac, and applied as corrections to the observed N.P.D.

The table below exhibits the names and approximate N.P.D. of the stars observed for the position of the Circle from the beginning of the year to July 1, (when it was removed from the wall,) together with the calculated excesses of the observed times of transit across the middle wire above the times of meridian transit, by means of which the Circle's position may be judged of. It was not thought worth while to give the observations in detail: the calculations were carefully verified.

Day of Observation 1839.	Star.	Approximate N.P.D.	Interval from meridian to middle wire.	Day of Observation 1839.	Star.	Approximate N.P.D.	Interval from meridian to middle wire.
May 28	$\alpha$ Coronæ Bor....	$62^{\circ}.44'$	$+2.52$	June 17	Rigel .....	$98^{\circ}.24'$	$-0.51$
...	$\alpha$ Serpentis.....	$83^{\circ}.4$	$+1.29$	19	Antares.....	$116^{\circ}.4$	$-1.77$
				...	Aldebaran.....	$73^{\circ}.49$	$+1.30$
June 6	$\beta$ Leonis .....	$74^{\circ}.31$	$+0.82$	20	Aldebaran.....	$73^{\circ}.49$	$+1.36$
15	$\delta$ Ophiuchi .....	$93^{\circ}.16$	$+0.96$	...	Rigel.....	$98^{\circ}.24$	$-0.33$
...	$\alpha$ Ophiuchi. ....	$77^{\circ}.19$	$+1.14$	...	$\beta$ Tauri.....	$61^{\circ}.32$	$+1.91$
16	Aldebaran.....	$73^{\circ}.49$	$+2.25$	21	Pollux.....	$61^{\circ}.35$	$+1.94$
...	Rigel.....	$98^{\circ}.24$	$-0.01$	24	Procyon.....	$84^{\circ}.22$	$+0.81$
17	Pollux.....	$61^{\circ}.35$	$+2.79$	25	Procyon.....	$84^{\circ}.22$	$+0.87$
...	$\beta$ Leonis.....	$74^{\circ}.31$	$+1.63$	...	Pollux.....	$61^{\circ}.35$	$+2.24$
...	Aldebaran .....	$73^{\circ}.49$	$+1.61$				



The following table relates in a similar manner to the position of the Circle from July 1 to the end of the year.

Day of Observation 1839.	Star.	Approximate N.P.D.	Interval from meridian to middle wire.	Day of Observation 1839.	Star.	Approximate N.P.D.	Interval from meridian to middle wire.
July 5	$\alpha$ Ophiuchi.....	77. 19	+ 0,47	Oct. 10	$\beta$ Leonis.....	74. 31	+ 1,00
...	$\beta$ Tauri.....	61. 32	+ 1,66	11	$\alpha$ Coronæ Bor....	62. 44	+ 1,51
6	Regulus.....	77. 15	+ 0,98	...	$\alpha$ Serpentis.....	83. 4	+ 0,44
Sept. 9	$\alpha$ Ophiuchi .....	77. 19	+ 0,69	15	$\beta$ Leonis .....	74. 31	+ 0,86
...	$\alpha$ Aquilæ.....	81. 33	+ 0,26	16	Arcturus.....	69. 58	+ 1,17
...	$\beta$ Aquilæ.....	84. 0	+ 0,18	...	$\epsilon$ Bootis.....	62. 15	+ 1,38
21	$\alpha$ Aquarii.....	91. 6	- 0,02	...	$\alpha$ Serpentis.....	83. 4	+ 0,54
...	$\alpha$ Pegasi.....	75. 40	+ 0,84	Nov. 26	$\alpha$ Ophiuchi.....	77. 19	+ 0,45
...	$\alpha$ Andromedæ ...	61. 48	+ 1,94	...	Spica.....	100. 19	- 0,86
26	Regulus.....	77. 15	+ 0,50	29	Arcturus.....	69. 58	+ 1,32
28	$\alpha$ Pegasi .....	75. 40	+ 0,86	...	$\epsilon$ Bootis.....	62. 15	+ 1,81
29	$\beta$ Leonis.....	74. 31	+ 0,89	Dec. 16	$\alpha$ Aquarii.....	91. 6	- 0,50
30	$\epsilon$ Bootis.....	62. 15	+ 1,60				
...	$\alpha$ Pegasi .....	75. 40	+ 0,99				

The following mean results, derived from the tables above by graphical construction, were employed in deducing by interpolation the required intervals for the Moon.

Interval from meridian transit to transit across middle wire							
at N.P.D.	60°	70°	80°	90°	100°	110°	120°
Before July 1	+ 2 <sup>s</sup> ,52	+ 1 <sup>s</sup> ,83	+ 1 <sup>s</sup> ,14	+ 0 <sup>s</sup> ,44	- 0 <sup>s</sup> ,26	- 0 <sup>s</sup> ,96	- 1 <sup>s</sup> ,65
After July 1	+ 1,85	+ 1,20	+ 0,55	- 0,10	- 0,75	- 1,40	- 2,05

The *Greenwich Mean Solar Time* of transit of centre, corresponding to the Right Ascension of centre from observation, is found by adding to the equivalent, in solar time, of the sidereal time, the next preceding mean time of the transit of the first point of Aries, diminished by 23<sup>s</sup>,48, as the Cambridge Observatory is 23<sup>s</sup>,54 east of the Greenwich Observatory. For greater expedition the seconds of the Greenwich Mean Solar Time are found by taking account only of the seconds and decimals of seconds of the solar equivalents, and the hours and minutes are extracted from the approximate mean times of meridian passage in the Nautical Almanac.

Whenever a Circle observation is not accompanied by a Transit observation, the Greenwich Mean Solar Time is calculated from the R.A. of centre at meridian transit in the Nautical Almanac, corrected for the difference of longitude of the Greenwich and Cambridge Observatories by subtracting  $0,00654 \times$  the horary variation of R.A. given in that work. In the single instance of the Circle observation of Pallas on April 19, the Greenwich Mean Solar Time is interpolated from those of April 17, 20, and 25.

The *seconds of tabular R.A. and N.P.D.*, from which the *Errors of Tables* are deduced, have been obtained for the Sun and Planets, by subtracting from the R.A. and N.P.D. at meridian transit in the Nautical Almanac,  $0,00654 \times$  the horary variations in R.A. and N.P.D. As the accurate Ephemeris of the small planets in the Nautical Almanac extends only to a limited time before and after opposition, the tabular places could not be exhibited collaterally with the observed places beyond those limits.

The seconds of tabular R.A. of the Moon's centre have been derived from the R.A. of the limb in the Section of Moon-culminating stars in the Nautical Almanac, by ap-

plying the sidereal time occupied by the transit of the semidiameter as there given, and subtracting  $0,00654 \times$  the variation of R.A. for  $1^h$  of longitude. The seconds of tabular N.P.D. of centre have also been obtained from the Section of Moon-culminating stars, by adding  $0,00654 \times$  the variation of declination in  $1^h$  of longitude.

Following the column of errors of the tables of the Moon in N.P.D. are two others, the first of which exhibits the effect on the errors in N.P.D. of increasing the parallax one-thousandth part; and the other, the effect of supposing the Earth spherical with the same equatoreal radius. The last mentioned column is formed by taking the parallax computed, as before stated, supposing the ratio of the axes to be that of 297 to 298, from the parallax separately computed, supposing the Earth to be spherical, and gives the means of readily altering that ratio if required.

The *Determination of the Position of the Ecliptic and of the mean error of the assumed Right Ascensions of the Fundamental Stars from the Circle Observations of the Sun in 1839* in pages 211 and 212, has been inserted to give the means of inferring absolute errors of the Solar, Lunar, and Planetary Tables from the observations of this Volume. The calculations have been made on the following principles.

The true longitude  $\lambda$ , and true North Polar Distance  $\Delta$ , of the Sun's centre, and the true obliquity  $I$ , at any instant, are related to each other by the equation,

$$\cos \Delta = \sin \lambda \sin I,$$

and the tabular longitude  $\lambda + \delta\lambda$ , the tabular North Polar Distance  $\Delta + \delta\Delta$ , and the assumed obliquity  $I + \delta I$ , in the Nautical Almanac, for the same instant, by the equation,

$$\cos(\Delta + \delta\Delta) = \sin(\lambda + \delta\lambda) \sin(I + \delta I).$$

Hence, neglecting powers of the errors  $\delta\lambda$ ,  $\delta\Delta$ ,  $\delta I$ , above the first,

$$\delta\Delta + \operatorname{cosec} \Delta \cos \lambda \sin I \delta\lambda + \operatorname{cosec} \Delta \sin \lambda \cos I \delta I = 0 \dots\dots\dots(A).$$

Now it is assumed that the variations of  $\lambda$  and  $I$  in the course of a year are in accordance with the theoretical calculations, and consequently that their values, as given in the Nautical Almanac, are affected, if by any, by constant errors, which it is proposed to find.

The actual errors of the Solar Tables in N.P.D. cannot be immediately derived from the errors in the columns of pages 200—202, because, though mere errors of observation may be supposed eliminated in the mean result from a large number of observations, there may still remain uncorrected instrumental errors and errors of reduction. Representing therefore by  $a$  any error in N.P.D. taken from those columns, and by  $p$  the excess of the observed above the true N.P.D., we shall have,

$$\delta\Delta = (\text{Tabular N.P.D.} - \text{observed N.P.D.}) + (\text{observed N.P.D.} - \text{true N.P.D.}) = a + p;$$

and as we are ignorant of the causes to which  $p$  may be owing, it is assumed to be constant within the limits of the tropics. The formula (1) in page 211 is obtained by putting  $m$  for  $\sin I \delta\lambda$ ,  $n$  for  $\cos I \delta I$ , and  $a + p$  for  $\delta\Delta$  in equation (A).

Instead of forming a separate equation from this formula for every different value of  $a$ , the whole number of observations is divided into twelve nearly equal groups, the mean of the values of  $a$  in each group is considered to correspond to the day nearest the numerical mean of the days of observation in the group, and  $\lambda$  and  $\Delta$  are taken for the mean noon of the mean day from the Nautical Almanac. In this manner twelve different equations were formed. The rest of the calculation for finding  $m$ ,  $n$ , and  $p$ , requires no explanation additional to that given in page 212.

Let  $\delta R$  now represent the mean excess for the year of the Sun's tabular R.A. above the true, (which is not sensibly different from the mean excess of the tabular longitude above the true); let  $\beta$  be the mean error of the tables in R.A. as derived from the



columns of pages 200—202; and suppose the mean excess of the assumed R.A. of the fundamental stars above the true to be  $q$ . Then,

$$\delta R = (\text{Tabular R.A.} - \text{observed R.A.}) + (\text{observed R.A.} - \text{true R.A.}) = \beta + q;$$

and as  $\delta R$  is known from the equation  $m = \sin I \delta \lambda$ ,  $q$  is also determined.

By this determination the mean excess of the assumed R.A. of the fundamental stars above the true is  $-0^s.033$ : by that of 1838 it was found to be  $+0^s.110$ , though the assumed R.A. of this year agree with those of 1839. The reason of the difference is that a correction has been applied to the observed R.A. in 1839 for discordance in the observations of first and second limbs. (See p. xxiv). The resulting value of  $p$  nearly agrees with that given by the observations of 1838. It is incorrectly stated in the note of p. lxxii of the Introduction to the Volume of 1838, that the value of  $p$  depends on the correction for discordance of zenith points at the zenith.

The *Comparisons of Clocks and Chronometers* in pages 214 and 215 are used in the reduction of the extra-meridional observations. When required for occultations of fixed stars by the Moon, the comparisons of Graham with Hardy were generally made for greater accuracy with a solar chronometer by coincidence of beats.

### EXTRAMERIDIONAL OBSERVATIONS.

ALL the observations out of the meridian, with the exception of occultations of fixed stars by the Moon, are measures of small differences either of Right Ascension or North Polar Distance made with the Northumberland Equatoreal and the Five-feet Equatoreal; and consequently small deviations of the line of collimation, and of the declination and polar axes from accurate adjustment, can have had very little effect on the results of the observations. The screws for the adjustments of the Five-feet Equatoreal have remained untouched. The error of collimation and the error of position of the declination axis of the Northumberland Equatoreal, have not been corrected since the determinations of their values on Aug. 21, 1838, as recorded in p. lxxiv of the Introduction of the Volume for that year. On Feb. 15, 1839, a new determination was made of the position of the polar axis in the manner following.

After adjusting one of the moveable wires of a double-wire micrometer to make an equatoreal star pass along it, and clamping the Telescope to the declination rod so as to prevent motion about the declination axis, a star, not far from the Equator, was bisected by that wire in three different positions of the Instrument, and the times of bisection and micrometer readings were noted. It was considered that if the polar axis were in exact adjustment, and the two last micrometer readings were corrected to the first for difference of refraction in N.P.D., the three readings should agree, notwithstanding any errors in the direction of collimation and position of the declination axis. The differences of the micrometer readings, supposing them small, serve to determine the error of position of the axis. For let  $\alpha$  and  $\beta$  be respectively the corrected *excesses* of the second and third micrometer readings above the first, the *upper* micrometer being made use of. This supposes the small circle in which the star moves, to be after the first bisection, apparently *above* and therefore really *below* the small circle described by the micrometer wire in its first position. Let  $P$  be the true pole of the heavens, and  $P'$  the pole of the instrument; and suppose  $P'$  to be to the *West* of the meridian and *South* of the pole. Call  $PP'$   $\rho$ , the angle which  $PP'$  makes with the meridian  $\gamma$ , and the hour angles of the star *West* from the meridian at the three bisections,  $\theta$ ,  $\theta'$ ,  $\theta''$ . Then if  $\delta$  = the arc drawn from the star in its first position to the pole of the instrument, its N.P.D. very nearly

$$= \delta + \rho \cos (\gamma - \theta) = \delta + \alpha + \rho \cos (\gamma - \theta') = \delta + \beta + \rho \cos (\gamma - \theta'').$$

From these three equations, (putting  $x$  for  $\rho \cos \gamma$  and  $y$  for  $\rho \sin \gamma$ ) it will be found that

$$x = \frac{\beta \cos \frac{\theta' + \theta}{2} \sin \frac{\theta' - \theta}{2} - \alpha \cos \frac{\theta'' + \theta}{2} \sin \frac{\theta'' - \theta}{2}}{2 \sin \frac{\theta'' - \theta}{2} \sin \frac{\theta'' - \theta'}{2} \sin \frac{\theta' - \theta}{2}}, \text{ and } y = \frac{\beta \sin \frac{\theta' + \theta}{2} \sin \frac{\theta' - \theta}{2} - \alpha \sin \frac{\theta'' + \theta}{2} \sin \frac{\theta'' - \theta}{2}}{2 \sin \frac{\theta'' - \theta}{2} \sin \frac{\theta'' - \theta'}{2} \sin \frac{\theta' - \theta}{2}}.$$



The following were the observations on Feb. 15. The star selected was  $\alpha$  Orionis, its apparent R.A. being  $5^h.46^m.28^s.7$  and N.P.D.  $82^\circ.38'$ .

Time of Observation by Chronometer U.	Time by Hardy.	Sidereal Time.	Hour angle West.	Refraction in N.P.D.	Reading of Upper Micrometer.	Increase of Microm. Reading in arc.	Increase due to Refraction.	Increase due to position of axis.
<i>h. m. s.</i> 5.45.0	<i>h. m. s.</i> 5.43.29,8	<i>h. m. s.</i> 5.43.56,2	<i>h. m. s.</i> - 0. 2. 32,5	58,77	9,989	"	"	"
7. 6.10	7. 4.38,9	7. 5. 5,3	+ 1.18.36,6	62,26	5,914	- 69,40	- 3,49	- 65,91
8.42.46	8.41.14,0	8.41.40,4	+ 2.55.11,7	79,60	1,978	- 136,43	- 20,83	- 115,60

On Feb. 15 at  $11^h$  Barometer reading =  $29^m,800$ ; Thermometer =  $41^\circ,3$ ; Refraction at  $45^\circ$  zenith distance =  $59'',08$ . The above refractions are calculated on the supposition that vertical refraction =  $59'',08 \times \tan \text{zen. dist.}$

The value of one micrometer revolution =  $17'',03$ .

The time by *U* was converted into time by Hardy, by means of the following comparisons made on the same day before and after the observations:—

$$\begin{array}{l|l} 3.54.10,0 \text{ } U = 3.52.41,0 \text{ } H & 9.30.10,5 \text{ } U = 9.28.33,0 \text{ } H \\ 3.55.35,0 \text{ } U = 3.54. 6,0 \text{ } H & 9.31.45,5 \text{ } U = 9.30. 8,0 \text{ } H \end{array}$$

The numbers in the last column are the values of  $\alpha$  and  $\beta$ , by means of which and the known hour angles from the meridian the values of  $x$  and  $y$  were calculated from the formulæ above. It was found that  $x = +111'',13$  and  $y = +208'',36$ . Hence the pole of the instrument was too much elevated by  $1'.51''$  and too much to the West by  $3'.28''$ .

On Feb. 20 I moved the screws for adjusting the position of the lower pivot. The distance between the two pivots being 23 ft. 8 in., the lower pivot was moved *upwards*  $0^m,15$  and *westward*  $0^m,29$ . The subsequent position of the axis may be judged of from the observations recorded below, which were made in the same manner as the preceding. The star employed in the first set was  $\lambda$  Pegasi, whose apparent R.A. was  $22^h.38^m.50^s,4$  and apparent N.P.D.  $67^\circ.16',4$ . In the other the star was *Polaris*, which is not too near the pole for the purpose, and requires no express calculation of refraction. Its apparent R.A. was  $1^h.2^m.31^s,0$ .

Day of Observation 1839.	No. of Series.	Time by Chronometer X.	Sidereal Time.	Hour angle West.	Reading of lower Micrometer.	Increase of Micrometer Reading in arc.	Increase due to Refractions.	Increase due to position of axis.
Sept. 26	1	<i>h. m. s.</i> 23.35.23	<i>h. m. s.</i> 23.32.12,1	<i>h. m. s.</i> + 0.53.22	9,405	"	"	"
...	2	1.26.42	1.23.31,0	+ 2.44.41	10,138	+ 12,46	+ 9,94	+ 2,52
...	3	2.22.14	2.19. 2,8	+ 3.40.12	10,662	+ 21,37	+ 20,92	+ 0,45
...	4	3.45.15	3.42. 3,6	+ 5. 3.13	12,583	+ 54,03	+ 53,96	+ 0,07
27	5	20.25.50	20.22.36,8	+ 21.43.46	7,945	- 24,82	+ 5,47	- 30,29
28	6	0.59. 3	0.55.46,7	- 0. 6.44	14,294	- 90,44	- 1,50	- 88,94
29	7	18.15.42	18.12.23,9	+ 17. 9.53	8,974	- 11,60	- 0,50	- 11,10
...	8	22.13. 7	22. 9.48,5	+ 21. 7.18	13,612			

One micrometer revolution =  $17''$ . The refractions on Sept. 26 were calculated for height of Barometer  $29^m,882$ , and Thermometer  $49^\circ,0$ : that of Sept. 27 for Barometer  $29^m,670$  and Thermometer  $53^\circ,9$ .

The conversion of the time by the chronometer into sidereal time was effected by means of the following comparisons of X with Hardy:

$$\begin{array}{l|l|l} \text{Sept. 26.} & \text{Sept. 28.} & \text{Sept. 29.} \\ 5.35.25,1 \text{ } X = 5.31.28,0 \text{ } H & 1.18.15,5 \text{ } X = 1.14.12,0 \text{ } H & 23.29.15,5 \text{ } X = 23.25.9,0 \text{ } H \end{array}$$

In the observations of  $\lambda$  Pegasi the sector-clamp retained a fixed position on the declination rod, but the Telescope was moved by the sector in N.P.D. between the observations, and was brought before each

observation to the same position by making the wires of the sector-microscope, which is attached to the Telescope, bisect the same division of the sector. In the observations of Polaris the Telescope was unmoved in N.P.D., and it was found that while the clamp retained its position, the sector reading in N°. 8 had altered  $0^{\circ}.295$  of the microscope-micrometer, or about  $3''$ . As this change was probably due to flexure it is not taken into account in the calculations.

In taking the results of the last column to calculate  $x$  and  $y$  by the foregoing formulæ, the signs must be changed, because the *lower* micrometer was used. Thus calculating with the hour angles of N°. 1, 3, and 4, and putting  $\alpha = -0''.45$ ,  $\beta = -0''.07$ , it will be found that  $x = +2''.2$ ,  $y = +2''.3$ . In the same manner from N°. 1, 4, and 5,  $x = +32''.8$ ,  $y = +32''.3$ ; and from N°. 6, 7, 8,  $x = +88''.3$ ,  $y = -19''.5$ . These values are calculated on the supposition that the frame of the axis and the Telescope are perfectly rigid. The discordance in the results seems to prove that this is not strictly the case.

On the whole it may be concluded from the preceding discussion that the error of position of the Polar axis is too small to have any effect on the observations contained in this Volume.

For determining the value of the micrometer revolution of the double-wire micrometer of the Northumberland Equatoreal, I observed, roughly at first, as follows.

Aug. 29 (1838), one of the wires was set at  $0^{\circ}$  and then at  $20^{\circ}$ , and the times of transit of *Polaris* by Chronometer *U* were  $23^{\text{h}}.5^{\text{m}}.34^{\text{s}}$  and  $23^{\text{h}}.19^{\text{m}}.28^{\text{s}}$  respectively. The interval ( $t$ ) =  $13^{\text{m}}.54^{\text{s}}$ . The N.P.D. of *Polaris* ( $\delta$ ) was  $1^{\circ}.33'.14''$ . Hence calculating the Equatoreal interval ( $a$ ) by the formula  $\tan a = \sin \delta \sin t$ , it will be found to be  $339''.03$ . Hence  $1^{\circ} = 16''.952$ .

1839. Feb. 18,  $11^{\text{h}}$ . The fixed wire, which is nearly at right angles to the micrometer wires, was placed by the position circle so that an equatoreal star passed along it, and the micrometer wires were put  $20^{\circ}$  apart. The following transits of *Procyon* were then taken.

Transits across first wire .....	$35,3$	$11,9$	$13,8$	$14,4$	$11,5$	$11,4$	$6,5$
Transits across second wire .....	$58,2$	$34,7$	$36,7$	$37,2$	$34,4$	$34,3$	$29,3$
Intervals .....	$22,9$	$22,8$	$22,9$	$22,8$	$22,9$	$22,9$	$22,8$

The mean of the intervals is  $22^{\text{s}}.857$ , and the corresponding equatoreal interval, since the declination of *Procyon* =  $5^{\circ}.38'$ , is  $22^{\text{s}}.746$ . Hence the value of  $1^{\circ} = 17''.059$ . It is here supposed that the readings of the two micrometer-heads agree at coincidence, (which was very nearly the case), and that the values of the micrometer revolutions of the two screws are exactly the same.

In consequence of the above determinations the first adopted value of the micrometer revolution was  $17''$ .

The value finally adopted was determined by the following transits of  $\delta$  Ursæ Minoris and *Polaris*. The two wires were placed at a convenient distance from each other, first on the entrance side of the field and then on the departure side, and generally the interval between the two positions of the same wire was an integral number of revolutions. Transits over each wire were observed in both positions.

TRANSITS OF $\delta$ URSÆ MINORIS. (Observer C.)									
Day of Observation 1839.	Microm.	Micrometer Reading.	Time of Transit by Chronometer X.	Interval.	Day of Observation 1839.	Microm.	Micrometer Reading.	Time of Transit by Chronometer X.	Interval.
Sept. 23	A.	<sup>r</sup> 25,000	<sup>h.</sup> <sup>m.</sup> <sup>s.</sup> 20 . 28 . 42,3	<sup>m.</sup> <sup>s.</sup> 8 . 0,7	Sept. 23	A.	<sup>r</sup> 23,000	<sup>h.</sup> <sup>m.</sup> <sup>s.</sup> 21 . 11 . 45,0	<sup>m.</sup> <sup>s.</sup> 6 . 40,0
	A.	0,000	20 . 36 . 43,0			A.	2,000	21 . 18 . 25,0	
	B.	0,000	20 . 30 . 18,5	7 . 58,3		B.	2,000	21 . 13 . 21,2	6 . 38,3
	B.	25,000	20 . 38 . 16,8			B.	23,000	21 . 19 . 59,5	
	A.	25,000	20 . 44 . 56,5	7 . 54,8		A.	23,000	22 . 51 . 35,5	6 . 39,8
	A.	0,000	20 . 52 . 51,3			A.	2,000	22 . 58 . 15,3	
	B.	0,000	20 . 46 . 32,5	7 . 52,5		B.	2,000	22 . 53 . 11,0	6 . 38,5
	B.	25,000	20 . 54 . 25,0			B.	23,000	22 . 59 . 49,5	



TRANSITS OF POLARIS. (Observer C.)										
Day of Observation 1839.	Microm.	Micrometer Reading.	Time of Transit by Chronometer X.	Interval.	Day of Observation 1839.	Microm.	Micrometer Reading.	Time of Transit by Chronometer X.	Interval.	
Sept. 23	A.	23,000	<i>h. m. s.</i> 23 . 23 . 40,0	<i>m. s.</i> 14 . 43,5	Sept. 28	B.	22,000	<i>h. m. s.</i> 0 . 7 . 3,5	<i>m. s.</i> 14 . 0,3	
	A.	2,000	23 . 38 . 23,5			B.	2,000	0 . 21 . 3,8		
	B.	2,000	23 . 27 . 8,5	14 . 44,0		B.	22,000	0 . 28 . 34,5	13 . 59,5	
	B.	23,000	23 . 41 . 52,5			B.	2,000	0 . 42 . 34,0		
	A.	23,000	23 . 47 . 30,5	14 . 47,0		A.	2,000	0 . 31 . 22,6	13 . 58,9	
	A.	2,000	24 . 2 . 17,5			A.	22,000	0 . 45 . 21,5		
	B.	2,000	23 . 51 . 0,5	14 . 42,5		Sept. 30	B.	2,000	21 . 32 . 26,5	13 . 59,0
	B.	23,000	24 . 5 . 43,0				B.	22,000	21 . 46 . 25,5	
	A.	23,130	24 . 16 . 17,0	14 . 19,0			A.	22,000	21 . 35 . 14,0	14 . 2,5
	A.	2,634	24 . 30 . 36,0				A.	2,000	21 . 49 . 16,5	
	B.	2,627	24 . 18 . 13,0	13 . 33,0			B.	2,000	22 . 10 . 14,8	13 . 53,7
	B.	22,073	24 . 31 . 46,0				B.	22,000	22 . 24 . 8,5	
	A.	23,000	24 . 56 . 20,5	14 . 41,5			A.	22,000	22 . 11 . 59,3	13 . 56,2
	A.	2,000	25 . 11 . 2,0				A.	2,000	22 . 25 . 55,5	
B.	2,000	24 . 59 . 44,5	14 . 5,0	B.	2,000	22 . 33 . 26,0	13 . 59,8			
B.	21,927	25 . 13 . 49,5		B.	22,000	22 . 47 . 25,8				
Sept. 28	A.	2,000	0 . 9 . 51,8	13 . 59,2	A.	22,000	22 . 36 . 13,6	13 . 56,4		
	A.	22,000	0 . 23 . 51,0		A.	2,000	22 . 50 . 10,0			
Several mistakes were made in writing down the minutes and the name of the micrometer, which it has not been thought worth while particularly to notice. The last four observations of Polaris on Sept. 23 were doubtful, the sky becoming cloudy. Those of Sept. 30 were not considered satisfactory: the best were made on Sept. 28.										

In making the above observations the micrometer wires were placed on Sept. 23 in such a position that the path of the star was touched by the fixed transverse wire, either at the first or the second transits. On Sept. 28 and 29, the fixed wire was a tangent to the path of Polaris at the middle of the field. The equatoreal intervals corresponding to the intervals in the table above were calculated by the formula  $\tan \alpha = \sin \delta \sin t \sec a$ ,  $\alpha$  being the equatoreal interval in arc,  $\delta$  the star's N.P.D.,  $t$  the observed interval in arc, and  $a$  a very small angle given by the equation  $\sin \alpha = \sqrt{2} \sin \delta \sin \frac{t}{2}$ , and introduced by considering that the two micrometer wires are parallel, instead of converging to the pole of the heavens. It was thought unnecessary to correct for refraction. The two micrometer screws are assumed to be exactly alike, and when the observed intervals correspond to the same distance between the wires, their mean has been taken for the value of  $t$ . The N.P.D. of  $\delta$  Ursæ Minoris Sept. 23 was  $3^{\circ}.24'.22''$ ; that of Polaris on Sept. 23,  $1^{\circ}.32'.44''$ , and on Sept. 28 and 30,  $1^{\circ}.32'.42''$ . From these data the following results were obtained;—

	Value of microm. revolution.	Weight of result.
By $\delta$ Ursæ Minoris Sept. 23 (1st set) .....	16,986 .....	2
..... (2nd set) .....	16,937 .....	3
By Polaris Sept. 23 .....	17,007 .....	4
..... Sept. 28 .....	16,973 .....	5
..... Sept. 30 .....	16,941 .....	3

The weights are estimated by considering both the number of observations and the circumstances under which they were made. The concluded mean from all is  $16''.970$ , which is the value of the micrometer revolution adopted in this Volume.

In addition to the observations recorded in pages lxxvi and lxxvii of the Introduction to the Volume for 1838, I made others also in 1839 to determine the value of the intervals between the Sector divisions of the Northumberland Equatoreal, and the value of the micrometer revolution of the Sector microscope. The following method was employed. Two stars,  $\lambda$  Pegasi and  $\mu$  Pegasi, conveniently separated in R.A. and N.P.D., were bisected in succession by one of the wires of the double-wire micrometer equatorially adjusted. The Telescope was moved in N.P.D. from one star to the other by the milled head of the Sector, whilst motion about the Polar axis was prevented by clamping the Hour Circle, and the Sector was fixed by being clamped to the declination rod. In most instances a division of the Sector, properly selected, was bisected by the cross wires of the Sector microscope before the observation, and the preceding star,  $\lambda$  Pegasi, on arriving at the middle of the field of view of the Telescope was bisected by the micrometer-wire. The Telescope was then moved in N.P.D. to bisect the following star by the same wire, and the time by the Chronometer of one of the bisections was noted. The sector readings were then written down, and in many cases the micrometer reading also, not as being required for the same purpose, but as serving to determine the position of the polar axis. (See p. xxx.) These observations are numerous, and give the means of judging of the degree of confidence to be placed in measures of small arcs by the Sector.

Day of Observation 1839.	No. of Series.	Star. Pegasi.	Time by Chrono- meter X.	Sector Reading.	Difference of Sector Readings.	Day of Observation 1839.	No. of Series.	Star. Pegasi.	Time by Chrono- meter X.	Sector Reading.	Difference of Sector Readings.		
			<i>h.</i> <i>m.</i>	<i>d.</i> <i>r.</i>	<i>d.</i> <i>r.</i>				<i>h.</i> <i>m.</i>	<i>d.</i> <i>r.</i>	<i>d.</i> <i>r.</i>		
Sept. 19	1	$\lambda$ $\mu$	0. 9	28. 0,000 9. 18,065	18. 1,935	Sept. 21	12	$\lambda$ $\mu$	23. 10	24. 0,000 5. 15,652	18. 4,348		
	2	$\lambda$ $\mu$	0. 48	24. 0,000 5. 16,274			3,726	13	$\lambda$ $\mu$	23. 22		24. 0,000 5. 14,575	5,425
	3	$\lambda$ $\mu$	1. 2	24. 0,000 5. 14,252			5,748	14	$\lambda$ $\mu$	23. 41		24. 0,000 5. 15,943	4,057
	4	$\lambda$ $\mu$	1. 14	24. 0,032 5. 15,497			4,535	15	$\lambda$ $\mu$	23. 55		24. 0,000 5. 16,562	3,438
	5	$\lambda$ $\mu$	1. 25	24. 0,000 5. 14,553			18. 5,447	16	$\lambda$ $\mu$	0. 5		24. 0,000 5. 16,332	3,668
Sept. 21	6	$\lambda$ $\mu$	21. 39	24. 0,000 5. 17,267	18. 2,733		17	$\lambda$ $\mu$	0. 14	24. 0,000 5. 15,536	4,464		
	7	$\lambda$ $\mu$	21. 53	24. 0,000 5. 17,032			2,968	18	$\lambda$ $\mu$	0. 25	24. 0,000 5. 14,987	5,013	
	8	$\lambda$ $\mu$	22. 5	24. 0,000 5. 16,836			3,164	19	$\lambda$ $\mu$	0. 36	24. 0,000 5. 18,246	1,754	
	9	$\lambda$ $\mu$	22. 17	24. 0,000 5. 18,638			(1,362)	20	$\lambda$ $\mu$	0. 46	24. 0,000 5. 15,957	18. 4,043	
	10	$\lambda$ $\mu$	22. 35	24. 0,000 5. 16,568			3,432	Sept. 26	21	$\lambda$ $\mu$	22. 54	24. 0,000 5. 15,347	18. 4,653
	11	$\lambda$ $\mu$	22. 58	24. 0,000 5. 16,160		18. 3,840	22		$\lambda$ $\mu$	23. 9	24. 0,000 5. 14,005	(18. 5,995)	

N<sup>o</sup>. 1 and 11, were 'unsatisfactory.'

N<sup>o</sup>. 6, was marked 'good.'

Before the second observation of N<sup>o</sup>. 9 the Telescope received a slight blow, which probably caused a slip of the clamp. The same circumstance occurred between the observations of N<sup>o</sup>. 22.

The Telescope was moved in R.A. between the observations of N<sup>o</sup>. 15, apparently without any injurious effect.



Day of Observation 1839.	N <sup>o</sup> . of Series.	Star Pegasi.	Time by Chrono- meter X.	Reading of Micro- meter A.	Sector Reading.	Difference of Sector Readings.	Day of Observation 1839.	N <sup>o</sup> . of Series.	Star Pegasi.	Time by Chrono- meter X.	Reading of Micro- meter A.	Sector Reading.	Difference of Sector Readings.
			<i>h. m. s.</i>	<i>r.</i>	<i>d. r.</i>	<i>d. r.</i>				<i>h. m. s.</i>	<i>r.</i>	<i>d. r.</i>	<i>d. r.</i>
Sept. 26	23	$\lambda$ $\mu$	 23. 19. 0		24. 0,000 5. 15,690	18. 4,310	Sept. 26	34	$\lambda$ $\mu$	 1. 26. 42	10,138	24. 0,000 5. 15,672	18. 4,328
	24	$\lambda$ $\mu$	 23. 27. 0		24. 0,000 5. 15,957	4,043		35	$\lambda$ $\mu$	 1. 36. 45	10,146	24. 0,000 5. 15,538	4,462
	25	$\lambda$ $\mu$	23. 35. 23	9,405	24. 0,000 5. 15,909	4,091		36	$\lambda$ $\mu$	2. 7. 23	10,391	24. 0,000 5. 15,763	4,237
	26	$\lambda$ $\mu$	 23. 47. 0		24. 0,000 5. 16,698	3,302		37	$\lambda$ $\mu$	 2. 22. 14	10,662	24. 0,000 5. 17,207	2,793
	27	$\lambda$ $\mu$	23. 52. 21	9,397	24. 0,000 5. 15,764	4,236		38	$\lambda$ $\mu$	2. 43. 5	11,305	24. 0,000 5. 16,155	3,845
	28	$\lambda$ $\mu$	 0. 4. 0		24. 0,000 5. 16,356	3,644		39	$\lambda$ $\mu$	 2. 55. 3	11,396	24. 0,000 5. 15,716	4,284
	29	$\lambda$ $\mu$	 0. 12. 0		24. 0,930 5. 16,846	4,084		40	$\lambda$ $\mu$	 3. 13. 0	11,622	24. 0,000 5. 15,468	4,532
	30	$\lambda$ $\mu$	0. 45. 48	9,737	24. 0,000 5. 15,536	4,464		41	$\lambda$ $\mu$	3. 27. 47	12,154	24. 0,000 5. 16,292	3,708
	31	$\lambda$ $\mu$	 0. 59. 0		24. 0,000 5. 16,967	3,033		42	$\lambda$ $\mu$	 3. 45. 15	12,583	24. 0,000 5. 15,442	18. 4,558
	32	$\lambda$ $\mu$	1. 6. 59	9,943	24. 0,000 5. 17,187	2,813		Sept. 27	43	$\lambda$ $\mu$	20. 25. 50	7,945	24. 0,000 5. 15,536
33	$\lambda$ $\mu$	1. 17. 5	10,074	24. 0,000 5. 16,096	18. 3,904								

The micrometer A was *below* when the Telescope looked southward. The times by X were not accurately noted unless micrometer A was read.

N<sup>os</sup>. 26 and 30, were 'unsatisfactory.' N<sup>os</sup>. 27, 33 and 36, were marked 'good.'

The sector readings above are expressed in intervals (*d*) between the sector divisions, and revolutions (*r*) of the sector microscope-micrometer. The differences of sector readings were obtained by subtracting the less sector reading from the greater, considering  $1^d$  to be equal to  $20^r$ . This is nearly the case; but in strictness, if  $x$  be the Run corresponding to one Sector interval,  $20^r + x = 1^d$ . Since however it happened in every observation of  $\mu$  Pegasi, that the division on the *negative* side of zero was bisected, as being the most convenient, the Sector readings for this star should all be increased by  $x$ , to bring them to what they would have been if the positive division had been bisected. Consequently in taking the differences  $x$  would disappear, and it need not therefore be taken into account.

By 12 Circle observations both of  $\lambda$  Pegasi and  $\mu$  Pegasi in 1839, the difference of their mean N.P.D. Jan. 1, 1839 was  $61'.58'',09$ . (See p. 192). Hence by calculation the apparent difference of N.P.D. on Sept. 22 was  $61'.58'',30$ , or  $3718'',3$ . This requires to be diminished by the mean difference of refraction in N.P.D. on the respective days, to obtain the mean measured intervals. The times by Chronometer X are convertible into times by Hardy, (and consequently into sidereal times,) by the following comparisons:—

$$\begin{array}{c}
 \text{Sept. 19} \qquad \qquad \qquad \text{Sept. 23} \qquad \qquad \qquad \text{Sept. 26} \\
 \begin{array}{ccc}
 h. & m. & s. \\
 22. & 23. & 0,7
 \end{array}
 X = \begin{array}{ccc}
 h. & m. & s. \\
 22. & 19. & 30,0
 \end{array}
 H \quad | \quad \begin{array}{ccc}
 h. & m. & s. \\
 1. & 51. & 15,0
 \end{array}
 X = \begin{array}{ccc}
 h. & m. & s. \\
 1. & 47. & 29,0
 \end{array}
 H \quad | \quad \begin{array}{ccc}
 h. & m. & s. \\
 5. & 35. & 25,1
 \end{array}
 X = \begin{array}{ccc}
 h. & m. & s. \\
 5. & 31. & 28,0
 \end{array}
 H
 \end{array}$$

The approximate R.A. of  $\lambda$  Pegasi was  $22^h.38^m.47^s$  and that of  $\mu$  Pegasi,  $22^h.42^m.14^s$ ; and the mean of their N.P.D. was  $66^\circ.46'$ . From these data I calculated the mean of the differences of refraction in N.P.D. of the two stars at the times of observation on each day. The amounts were,  $1'',5$  on Sept. 19,  $1'',4$  on Sept. 21, and  $1'',8$  on Sept. 26.

Again, I observed as follows on Sept. 26 to determine the Run of the Sector microscope-micrometer.

	<i>r.</i>	<i>r.</i>	<i>r.</i>
Micrometer reading for bisection of division 12 .....	0,000	0,000	0,000
..... 13 .....	20,057	20,083	20,066
Excess of latter reading .....	0,057	0,083	0,066

The mean excess is  $0^r,069$ , and hence  $1^d = 20^r,069$ .

We have, therefore, the following mean results, in the calculation of which Nos. 9, 22, and 43 in the above table are not taken into account.

Day of Observation 1839.	Mean Apparent Difference of N.P.D.	Mean Difference of Sector Readings.	Consequent value of $1^d$ .	Number of Observations.
Sept. 19	3716 <sup>''</sup> ,8	$\begin{smallmatrix} d. & r. & d. \\ 18.4,278 & \text{or} & 18,21316 \end{smallmatrix}$	204 <sup>''</sup> ,072	5
21	3716,9	18.3,739 or 18,18631	204,379	14
26	3716,5	18.3,968 or 18,19772	204,229	21

Giving to the three results weights proportional to the respective number of observations the final result is,  $1^d = 204'',262$ . The adopted value, obtained by calculating in a somewhat different manner, is  $204'',258$ ; whence the value of one revolution of the Sector micrometer is  $10'',178$ .

The discordance which the foregoing Table exhibits in the measures of the difference of N.P.D. of the two stars, seems to prove that the Sector cannot be depended upon for accurate measurement. I supposed, at first, that the differences arose from the shifting of the clamp on the declination rod; but in the observations of Sept. 26 I assured myself that this was not the case. The greatest deviation of a single measure from the mean of all the measures of that day amounts to  $12''$ .

The value of the micrometer revolution of the Five-feet Equatoreal has been always assumed to be  $33'',400$ , as determined in 1836.

To determine the coincidence readings of the micrometer wires of the Northumberland Equatoreal and the Five-feet Equatoreal I observed as follows.

1839. March 26,  $3\frac{1}{2}^h$ , the wire of micrometer A of the Northumberland Telescope was set at  $10'',000$ , and the wire of B was made to touch it alternately on one side and the other at the middle of the field. The readings of B were,

10,036, 9,998, 10,030, 9,997, 10,036, 9,998, 10,034, 9,997,

the mean of which is 10,016, which is the coincidence reading employed in this Volume. The two wires are not exactly parallel. The coincidence reading at the boundary of the field with eye-piece of power 213, on the side of the comb, (which when A is uppermost is the *left* side) was found to be 9,990, and on the opposite side 10,042.

The above readings of B shew that the thickness of the wires, supposing them equal, is measured in micrometer revolutions by  $0'',018$ , and consequently in arc by  $0'',31$ .

1839. Oct. 24,  $22^h$ , the coincidence readings of the micrometer wires of the Five-feet Equatoreal with the fixed wire at the five vertical wires were observed. The graduated face of the Declination Circle was West, and the Object-glass was turned southward.

*Coincidences of wire of Upper Micrometer. (U).*

I.	II.	III.	IV.	V.
10,083	10,076	10,083	10,087	10,073
9,992	9,993	9,998	10,006	9,998
10,073	10,074	10,085	10,075	10,076
9,993	9,994	9,997	10,003	9,998
10,075	10,076	10,082	10,082	10,075
9,992	9,995	10,002	9,998	9,997
Means ..... 10,035	..... 10,035	..... 10,041	..... 10,042	..... 10,036



*Coincidences of wire of Lower Micrometer. (L).*

I.	II.	III.	IV.	V.
9,889	9,954	9,948	9,951	9,946
9,956	9,888	9,880	9,878	9,947
9,893	9,953	9,946	9,960	9,868
9,966	9,888	9,886	9,874	9,946
9,896	9,963	9,953	9,951	9,866
9,972	9,889	9,886	9,877	9,872
Means ..... 9,929 .....	9,923 .....	9,917 .....	9,915 .....	9,908

These coincidences differ little from those obtained in 1837 and recorded in page lxxiii of the Introduction to the Volume of that year. The coincidences at wire III were used for the observations of Encke's comet in 1838.

*I. Differences of North Polar Distance of Mars and adjacent stars, observed with the Northumberland Equatoreal and the Five-feet Equatoreul, and calculation of Geocentric North Polar Distances of the Planet, in pages 218—229.*

These observations require little explanation in addition to that contained in the notes at the bottom of the pages. The manner of observing was for the most part the same with both instruments. During each set of observations motion about the polar axis was prevented by clamping the Hour Circle; the star and the planet were observed at the same part of the field unless the contrary is expressed; and in most cases both limbs of the planet were bisected, so as to determine differences of N.P.D. of each limb and the star, and at the same time furnish measures of the diameter. This was effected in observations with the Northumberland Equatoreal by means of the two moveable wires of the double-wire micrometer, (there being no fixed wire), and in observations with the Five-feet Equatoreal, either by the two moveable wires, or by one of them and the fixed wire. The times of observation by the chronometer or clock, both of the star and the planet were noted, and are converted into sidereal times by means of the comparisons in page 214. The micrometer readings increase as the micrometer-wires move towards the micrometer-heads. Hence the reading of that micrometer whose head is uppermost when the Telescope looks southward increases as the N.P.D. increases, and the reading of the other micrometer decreases. By this consideration the *sign* of the algebraic excess of the N.P.D. of the limb of Mars above the N.P.D. of the star is determined. The *difference* of the N.P.D. of the limb and the star in micrometer revolutions, when not measured by the same micrometer wire, is readily deduced by means of the coincidences given in the spaces below the columns of the left-hand pages. This difference, with the proper sign attached, and converted into arc by multiplying by the value in arc of one micrometer revolution, is placed in the last column but two of the left-hand pages. It should be observed that the results in this column have received minute corrections for refraction, and are consequently differences of N.P.D. affected only by parallax and errors of observation. The *Diameters* of Mars in the next column are merely differences of the measures in the preceding column when they have the same sign, and their sums when they have different signs.

On April 1 differences of N.P.D. too large to be measured by the micrometer wires, were observed with the Sector of the Northumberland Telescope in the manner described in page xxxiii. The Sector readings increase with the N.P.D., and the sign of the algebraic excess of N.P.D. of Limb above N.P.D. of star is determined accordingly. These differences of N.P.D. are corrected for refraction. For reasons already stated, the measures obtained by this method are not entirely worthy of confidence.



Under the head of *Calculation of Geocentric North Polar Distances of Mars* in the right-hand pages, the Greenwich Mean Solar Time in the *first* column is deduced in the usual manner from the sidereal time of observation of the planet. The hour angle in the *second* column is the approximate difference between the sidereal time of observation of the star and its R.A. in the Nautical Almanac. By means of this hour angle and the approximate N.P.D. of Mars, the parallax in the *third* column was calculated in the manner stated in the Introduction of the Volume of 1838 (p. lxxxvii). The correction for semidiameter in the *fourth* column is the value in the Nautical Almanac increased by 1",2. This correction is derived from the Circle observations of Mars from Feb. 23 to April 30. (See p. 196). The semidiameters adopted on April 1 were given immediately by observation as stated in the note. The excess of the N.P.D. of Mars' centre above the N.P.D. of the star in the *fifth* column, when both limbs were observed, is the mean of the apparent excesses of the N.P.D. of the limbs above the N.P.D. of the star, with the parallax correction added; but when one limb only was observed, it is the apparent excess of N.P.D. of the limb, with the corrections for parallax and semidiameter added. The assumed N.P.D. in the *sixth* column were taken without alteration from the Nautical Almanac. The concluded N.P.D. of Mars' centre in the *seventh* column is the algebraic sum of the assumed N.P.D. of the star and the concluded excess of the N.P.D. of the planet above the N.P.D. of the star. The seconds of tabular N.P.D. in the *eighth* column were interpolated for the given Greenwich Mean Solar times with second differences from the Nautical Almanac. The errors of tabular N.P.D. in the *ninth* column, appear to be affected by errors in the assumed N.P.D. of the stars, but as these stars are observed with the Circle, there will hereafter be means of applying corrections on this account.

The mean results of the measures of the diameter of Mars in the foregoing observations are collected in page 230 and are compared with the tabular values. The measures by the two instruments differ by about the same quantity from the tabular diameters.

II. *Differences of R.A. and N.P.D. of Galle's First Comet and neighbouring stars, observed with the Northumberland Equatoreal and the Five-feet Equatoreal; and Calculation of Geocentric R.A. and N.P.D. of the Comet*, in pages 232—247.

The greater part of these observations were made in 1840; but for the sake of exhibiting the series collectively they are published in this Volume.

The observations of *Differences of R.A. and N.P.D. with the Northumberland Equatoreal*, in page 232, were made (with the exception of the observations of Jan. 10) in the manner stated in pages xii and xiii of the Introduction of 1838, and adopted in the observations of Encke's comet in that year. The times of observation by chronometer X are the times of bisecting the comet or star by the straight boundary of the field, which by the position circle was placed perpendicular or parallel to the equatoreal direction according as the observations were in R.A. or N.P.D. The times by X are converted into sidereal times by the comparisons in p. 215. The Hour Circle reading is that of the *moveable* index, which is attached to the frame of the polar axis and is moved with it by hand or by a tangent-screw on the Hour Circle, while the Hour Circle is carried by the Clock. If the Clock were exactly regulated to sidereal time, the apparent excess of the R.A. of the comet above the R.A. of the star, would be the algebraic excess of the reading of the moveable index for bisection of the comet above the reading for bisection of the star, the order of the graduation of the Circle being from South through East to North. A correction is applied to the latter reading for the rate of the Hour Circle. On Dec. 29 the rate was ascertained by the following comparisons:—

13.56.33,0 X = 21.10.0 of Hour Circle. | 14. 4.54,0 X = 21.18.20 of Hour Circle.



On Jan. 6 it was inferred from the index readings for the star, considering that if there had been no rate, they would have been the same in the two observations. The differences of R.A. observed Jan. 10 are merely the differences of the sidereal times of observation, the instrument being stationary between the observations of each set.

The apparent excess of the N.P.D. of the comet above the N.P.D. of the star in page 232, is, (since the Sector readings increase with the N.P.D.) the algebraic excess of the Sector reading for the comet above the Sector reading for the star, converted into arc by means of the values of one sector interval and one microscope-micrometer revolution already given.

The *Calculation of Geocentric R.A. and N.P.D.* in page 233, is conducted in the same manner as for the observations with the Five-feet Equatoreal and is explained further on.

The observations of *Differences of R.A. of Galle's First Comet and neighbouring stars with the Five-feet Equatoreal* in pages 234, 236, and 238, were made with the instrument clamped during each set. The comet was observed either on its entrance at the teeth of the comb, or on departing at the straight boundary, and, when not too faint, at some of the wires. The star was observed in the greater number of instances at the same places as the comet. When this was not the case the time of observation of the star is always corrected to the *mean* of the places of observation of the *comet*. The equatoreal intervals of entrance, departure, and the five wires from the middle wire, which were employed for these corrections are the following:—

Entrance.	Wire I.	II.	III.	IV.	V.	Departure.
– 48 <sup>s</sup> .58	– 20.98	– 10.33	0.00	+ 10.55	+ 21.11	+ 69.74

The data for the calculation of the intervals for entrance and departure were collected from all the observations of transits of stars from entrance to middle wire and from middle wire to departure in pages 234, 236, and 238, and the mean results are adopted. The intervals for the wires are the same as those in p. lii of the Introduction of the Volume for 1835, the system of wires being the same as that period. In N<sup>os</sup>. 11 and 13, the intervals employed were inferred from observations made expressly for these instances, as mentioned in the notes.

The *concluded* time of transit by the clock for the Comet is therefore merely the mean of the observed times; but for the star it is the mean of the observed times, corrected, when necessary to that which would have been the mean if the star had been observed at the same positions as the comet. The concluded times by Graham are converted into sidereal times by the comparisons in p. 215. The apparent excess of the R.A. of the comet above the R.A. of the star in the first column of the left-hand pages, is the algebraic excess of the sidereal time for the comet above that for the star.

The observations of *Differences of N.P.D. of Galle's First Comet and neighbouring stars with the Five-feet Equatoreal* in pages 240, 242, 244 and 246, were made with the instrument fixed during each set, the Telescope moving only in N.P.D. (excepting in the instance of N<sup>o</sup>. 12). Unless it is otherwise said, the comet and star were bisected at the same part of the field. The times of bisection both of the comet and star were noted. In general these are the times of transit across the first wire in C's observations, and across the middle wire in G's. They are converted into sidereal times by the comparisons of p. 215.

When the difference of N.P.D. was not too large it was measured by one or both of the micrometer wires. The micrometer used is stated in the *seventh* column, and the micrometer reading in the next column. It is to be understood, when no micrometer is mentioned, that the star or comet was bisected by the fixed wire.



In all other cases the difference of N.P.D. of the comet and star was measured by the declination circle. The pointer reading is put in the *sixth* column. The microscope A or B is mentioned in the *seventh* column. Both, with few exceptions, were read off in each observation. The microscope readings are in the *eighth* column.

The corrections for errors of division in the *ninth* column were taken, as far as they could be, from the Tables in pages lvi—lxi of the Introduction to the Cambridge Observations of 1835. The rest are contained in the following Table, which was formed precisely according to the method described in p. lv of that Introduction, the same double microscope having been employed in spanning the intervals between the divisions.

Division.	Correction to Division.	Division.	Correction to Division.	Division.	Correction to Division.	Division.	Correction to Division.
266. 15	38,8*	86. 15	78,7*	272. 30	40,5	92. 30	78,2
20	38,6	20	79,7	35	40,0	35	77,4
25	37,8	25	79,1	40	40,0	40	77,4
30	37,6	30	78,8	45	39,0	45	75,9
35	37,2	35	78,2	50	39,4	50	77,6
40	37,0	40	77,9	55	39,5	55	76,2
45	36,0	45	78,2	273. 0	38,4	93. 0	77,4
50	36,3	50	79,6	5	38,8	5	76,7
55	36,9	55	79,6	10	38,3	10	78,3
267. 0	37,0	87. 0	79,7	15	38,4	15	77,6
5	36,9	5	79,7	20	38,7	20	81,1
10	37,8	10	79,1	25	37,9	25	79,5
15	37,7	15	79,0	30	37,8	30	78,4
20	38,2	20	80,0	35	38,7	35	78,2
25	38,5	25	79,2	40	39,9	40	78,8
30	40,1	30	79,7	45	40,2*	45	77,5*

\* These corrections were derived from the Table of errors of fundamental points in page lv of the Introduction of 1834.

The corrections for Runs in the *tenth* column are calculated for each microscope separately according to the rule given in page xvi. The runs for arcs of 5' are for microscope A + 4'',7, and for microscope B + 0'',2. These values are mean results of runs taken at five different positions with each microscope at midnight of Nov. 4. (See Introduction of 1838, p. lxxxv.)

The concluded reading of the Declination Circle in the *eleventh* column is the mean of the microscope readings corrected for errors of division and for runs.

The apparent excess of the N.P.D. of the comet above the N.P.D. of the star in the *twelfth* column, when measured by the declination circle, is the algebraic excess of the concluded reading for the comet above the concluded reading for the star, the circle reading increasing with the N.P.D. When measured by the micrometer L, it is the algebraic excess, (converted into arc by multiplying by 33'',400) of the reading for the star above that for the comet: when measured by both micrometers, it is the algebraic excess of the sum of the coincidence readings above the sum of the micrometer readings, converted into arc, the comet having in every instance been bisected by micrometer L. In the few instances in which the star or comet was bisected by a micrometer wire when the difference of N.P.D. was measured by the declination circle, the corrections to the fixed wire were calculated from the coincidence readings in the usual manner, and are stated in the notes.

The calculation of the *Geocentric Right Ascensions and North Polar Distances of the Comet* from the apparent differences of R.A. and N.P.D. obtained in the manner above



described, is effected by first correcting these differences for refraction and parallax, and then adding the corrected differences with their proper signs to the assumed R.A. and N.P.D. of the stars. The calculation is exhibited in the pages opposite to those which contain the observations, and is conducted very nearly in the same manner for the R.A. as for the N.P.D., so that the contents of the columns may be explained conjointly.

The following are the assumed mean R.A. and N.P.D. Jan. 1, 1840 of the stars which occur in the observations of Galle's First Comet.

Name of Star.	Mean R.A. Jan. 1, 1840.			Mean N.P.D. Jan. 1, 1840.		
	<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>°</i>	<i>'</i>	<i>''</i>
<i>l</i> Ophiuchi.....	16	37	22,19	88	40	49,38
21 Ophiuchi .....	16	43	18,28	88	30	19,66
* (I) .....	16	45	14,59	86	42	29,24
30 Ophiuchi .....	16	52	37,65	93	58	35,23
41 Ophiuchi .....	17	8	24,06	90	15	32,48
$\beta$ Ophiuchi .....	17	35	34,24	85	21	36,16
* (II) .....	17	41	14,83	87	59	3,75
70 Ophiuchi .....	17	57	22,01	87	27	26,76
* (III) .....	18	8	56,95	89	2	35,64
<i>e</i> Serpentis .....	18	23	41,61	91	6	36,59
* (IV).....	18	29	22,89	90	26	17,04
* (V) .....	18	38	12,88	91	7	26,39
<i>l</i> Aquilæ .....	18	38	41,16	94	54	45,06
* (VI) .....	18	48	4,00	92	0	0,04
<i>f</i> Aquilæ .....	19	12	0,39	95	42	30,75
* (VII) .....	19	14	8,64	94	0	56,07
<i>P</i> Aquilæ .....	19	29	17,99	94	59	54,70

The N.P.D. of *e* Serpentis was derived from the Cambridge Observations of 1837. The R.A. of this star and the R.A. and N.P.D. of 70 Ophiuchi were taken from the Astronomical Society's Catalogue. The places of all the other stars were determined by observations with the transit and circle in 1840 and 1841, which will appear in the published Observations of those years.

The 'approximate hour angle east from the meridian' in the observations with the Northumberland Equatoreal (p. 233) is the difference between the R.A. of the object and the sidereal time of observation, the R.A. of the comet being approximately derived from that of the star, for the observations in R.A., by means of the apparent differences of R.A. given by the observations, and for the observations in N.P.D. being interpolated from the Ephemeris in the *Astronomische Nachrichten* (No. 395, p. 173). On Jan. 10 the hour angle is the same for the comet as for the star, the observations having been made with the instrument stationary.

The hour angle for the observations in R.A. with the Five-feet Equatoreal is always the difference between the R.A. of the star and the sidereal time for the star on the opposite page. This is also generally the case for the observations in N.P.D. But when the comet and star were not bisected in the same part of the field, a different hour angle is set down for the comet, which is inferred from the other by the known interval in time between the places of observation. In the instance of No. 12, in which the instrument was moved about the polar axis, the hour angle for the comet is the difference between the sidereal time of observation and its R.A. obtained by interpolation from the above named Ephemeris.

The 'approximate N.P.D. of object' for the observations in N.P.D. are for the star its assumed N.P.D., and for the comet its interpolated N.P.D., expressed to the nearest tenth of a minute, it being previously ascertained that the N.P.D. of the Ephemeris differed little from those given by observation. For the observations in R.A. the approximate N.P.D. are the same for the same days, with the exception of slight differences in the N.P.D. for the comet proportional to differences in the hour angles. These approximate N.P.D. and hour angles are employed in the calculation of corrections for refraction and parallax.

The corrections for *refraction* in R.A. and N.P.D. were obtained by first calculating independently the *vertical* refractions of the star and comet. The zenith distance of the star was accurately deduced from its hour angle, its approximate N.P.D., and the colatitude of the observatory; and the zenith distance of the comet was similarly deduced from its hour angle, the colatitude, and the approximate N.P.D. of the star increased by the *apparent* excess of the N.P.D. of the comet above the N.P.D. of the star, which in every instance was furnished by the observations of differences of N.P.D. The vertical refractions were calculated for these zenith distances exactly as in the Circle observations, regard being had to the states of the barometer and thermometer, which were registered near the times of observation. The refractions in R.A. and N.P.D. were then derived from the vertical refractions by calculating the angles of position of the star and comet from their hour angles, their zenith distances, and the colatitude. The required correction for refraction both in R.A. and N.P.D. is the algebraic excess of the refraction for the comet above the refraction for the star. There is some inaccuracy in the absolute refractions obtained in this manner, because the true zenith distance of the star is employed instead of the zenith distance altered by refraction; but as the error must nearly equally affect the refractions of the star and the comet, the *difference* of the refractions must be very nearly correct. As this correction is in many instances of large amount it was thought necessary to calculate it with the degree of accuracy here described.

The corrections for *parallax* in R.A. and N.P.D. were calculated from the hour angles and approximate N.P.D. of the comet by the formulæ in p. lxxxvii of the Introduction of 1838, the log. distance being interpolated from the Ephemeris in N<sup>o</sup>. 395 of the *Astronomische Nachrichten*.

The assumed R.A. and N.P.D. of the stars were calculated by the usual formulæ from their mean R.A. and N.P.D. Jan. 1, 1840. The concluded R.A. or N.P.D. of the comet is the algebraic sum of the assumed R.A. or N.P.D. of the star, the apparent excess of R.A. or N.P.D. of the comet, and the refraction and parallax corrections. The Greenwich mean solar times were all calculated from the sidereal times of observation of the comet, and are used in obtaining the interpolated R.A. and N.P.D. from the Ephemeris in the *Astronomische Nachrichten*, (allowing  $53^m.35^s.5$  for the difference of the meridians of Berlin and Greenwich); whence by comparison with the concluded R.A. and N.P.D., the errors of the interpolated R.A. and N.P.D. are derived.

The *Remarks on the appearance of the Comet*, and the observations of the direction of its tail in pages 248 and 249, require no additional explanation.

Respecting the *Micrometer measures of the apparent diameters of Venus, Jupiter, Saturn, and Saturn's Ring*, in pages 250—252, those only that were made with the divided-glass eye-pieces require any explanation. These eye-pieces were constructed by Simms under Mr Airy's direction. The component lenses are arranged exactly as in the common erecting achromatic eye-piece of four lenses, with the difference that the third lens from the eye, near which all the rays cross the axis, is divided, and one half is moveable on the other by a micrometer-screw with graduated head. The pencil of rays from each point of an



object, is limited by a diaphragm near the divided lens and parted between the two halves of the lens. Thus, excepting when the centres of the two halves coincide, two images are formed, which may be employed in the usual manner for micrometer measures. The values of the micrometer revolutions were not ascertained till the present year (1841), there being no arrangement for determining the angular direction of the separation of the images. This is now effected by means of a fine wire placed at the focus of the eye-lens so as to pass through the centre of the field, and be capable of motion about the axis of the eye-piece, independently of the motion given by the position circle. For finding the value of the micrometer revolution, this wire was made to coincide with the direction of separation of the images of a star, and then by the position circle was placed in the equatoreal direction. The wire was next placed by guess at right angles to the direction of separation, and, the instrument being fixed, the interval between the transits of the two images across the wire was observed. The following results were obtained.

1841. March 10, 12<sup>h</sup>, ten observations of transits of  $\beta$  Ursæ Minoris, with eye-piece No. 10, gave for the mean value of the interval between the transits of the images, 16<sup>s</sup>.445. The separation reading of the micrometer was 15<sup>r</sup>.021, and the coincidence reading by five observations of coincidences of the images of the star was 10<sup>r</sup>.008. (This coincidence reading differed by only 0<sup>r</sup>.002 from the mean result of a large number of alternate contacts of the limbs of the images of Venus observed on March 9.) Hence as the N.P.D. of  $\beta$  Ursæ Minoris was 15<sup>o</sup>.12', the value of one revolution is found to be 12<sup>r</sup>.904.

The same method was not adopted in determining the micrometer revolution of No. 8, as on account of the length of this eye-piece, the illumination of the field was not sufficient to make the wire visible. For this reason transits of the Limb of the *Moon* were employed.

1841. Oct. 6, 12<sup>h</sup>, when the Moon's motion in N.P.D. was small, the images of the Limb were separated in the equatoreal direction, and the wire was placed in the transverse direction by means of a selected point of the Moon's surface. Three sets of transits of the images of the Limb were taken while the clock was carrying the hour circle, the mean of which gave 2<sup>m</sup>.15<sup>s</sup> for the interval between the transits of the images. By comparisons with chronometer X before and after the observations, the hour circle gained 18<sup>s</sup> in 15<sup>m</sup>.52<sup>s</sup>, and consequently 2<sup>s</sup>.55 in 2<sup>m</sup>.15<sup>s</sup>. The mean of the times of observation was found by comparison of X with Hardy to be almost exactly 12<sup>h</sup> Greenwich Mean Solar Time, when the Moon's geocentric hourly variation of R.A. was 2<sup>m</sup>.35<sup>s</sup>. Hence the *apparent* change of R.A. in 2<sup>m</sup>.15<sup>s</sup> was found by calculation to be 5<sup>s</sup>.49. The sidereal interval between the images was therefore 2<sup>s</sup>.55+5<sup>s</sup>.49, or 8<sup>s</sup>.04, which is the interval which would have been given if the observation had been made by a star of the same declination as the Moon with the instrument fixed. The Moon's declination was 26<sup>o</sup>.19', the separation reading of the micrometer was 3<sup>r</sup>.907, and the coincidence reading by observations on March 9, was 9<sup>r</sup>.945. From these data the value of one revolution comes out 17<sup>r</sup>.897\*.

The Sidereal Times, and Greenwich Mean Solar Times of observation of the *Occultations of fixed Stars by the Moon* in page 254, were calculated from the comparisons of clocks and chronometers in pages 214 and 215. The *Calculation of Occultations* (pages 255—268) was conducted in the manner explained in the Introduction of 1838, excepting that the errors of the apparent R.A. and N.P.D. of the Moon's centre were not assumed to be the same as the Geocentric errors  $x''$  and  $y''$ . Retaining the same signification of the letters, the formulæ employed for calculating the former from the latter were,

$$\text{Error of apparent R.A.} = x \left( 1 + \frac{p}{15 - a} \right) \pm y (\theta - \theta') \cot \lambda'.$$

\* I found by very exact measurement that the focus of the object-glass is very close to the fourth lens of this eye-piece, and consequently that the divergence of the rays is very little altered in passing through this lens before they fall on the divided lens. It hence follows that the value of one micrometer revolution is very nearly the angle subtended at the centre of the object-glass by the space which the moveable half of the divided lens is carried over by one turn of the screw. This space I found by an exact scale of inches to be 0<sup>n</sup>.02035, and the distance of the divided lens from the centre of the object-glass to be 19<sup>n</sup>.7<sup>n</sup>.05. Hence 1<sup>r</sup>=17<sup>r</sup>.858. This determination is perhaps not so good as that above.

$$\text{Error of apparent N.P.D.} = y(1 + F' \cos z') \mp x \cdot \frac{q}{15 - a'},$$

in which  $p = (15 - a) (\theta - \theta') \cos \theta \operatorname{cosec} \theta'$ , and  $q = (15 - a') (\theta - \theta') \sin \lambda \cos \lambda$ , quantities previously calculated. The upper or lower sign is used according as the Hour Angle is West or East.

It is not correctly stated in the Introductions of the Volumes for 1837 and 1838 that the term ( $t$ ) is added to the Greenwich Mean Solar Time, to take account of any error in the assumed longitude of the Cambridge Observatory. The coefficient of  $t$  in the final equation resulting from the calculation of the occultation, refers only to an error in the *sidereal time of observation*. To take account of an error ( $\tau$ ) in the assumed longitude, the errors  $x$  and  $y$  of the geocentric R.A. and N.P.D. of the Moon's centre may be supposed to consist of tabular errors  $x_1$  and  $y_1$ , and errors  $\alpha\tau$ ,  $\beta\tau$ , arising from their being computed for an erroneous longitude and consequently for an erroneous Greenwich Mean Solar Time; so that  $x = x_1 + \alpha\tau$ , and  $y = y_1 + \beta\tau$ . These values of  $x$  and  $y$  are to be substituted in the above formulæ, and the resulting values of the errors of apparent R.A. and N.P.D. are to be put for  $x$  and  $y$  respectively in the final equations of the Volumes for 1837 and 1838. In the present Volume it is only necessary to substitute  $x_1 + \alpha\tau$  and  $y_1 + \beta\tau$ , for  $x$  and  $y$ .

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All the Observations in this Volume were originally recorded in pencil writing in small memorandum books, which are carefully preserved for future reference.

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TRANSITS AS OBSERVED,  
AND  
CALCULATION  
OF THE  
APPARENT RIGHT ASCENSIONS.

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1839.



## TRANSITS OBSERVED IN THE YEAR 1839.

Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Jan. 7	$\alpha$ Ophiuchi .....	53,2	7,8	21,1	35,1	48,9	2,7	17.27.16,8		B.
	$\delta$ Ursæ Minoris .....	11.27,5	15.21,3	19.3,6	22.52,4	26.39,2	30.24,7	18.34.10,3		B.
Jan. 8	$\odot$ 1 L. ....	32,3	47,7	2,0	16,5	31,1	45,9	19.15.0,4		B.
	$\odot$ 2 L. ....	54,0	9,0	23,3	38,1	52,8	7,4	19.17.21,9		B.
	Venus 1 L. ....	47,0	2,0	16,4	31,2	46,0	0,8	19.38.15,2		B.
	$\alpha$ Aquilæ .....	21,6	35,7	49,1	2,9	16,7	30,1	19.42.43,6		B.
	$\alpha$ Andromedæ .....	26,1	41,7	57,1	12,2	27,3	42,9	23.59.58,1		B.
	Polaris .....	35.9,5	43.41,2	...	0.28,4	8.49,7	17.10,3	1.25.34,6	-1.24,26	B.
	(a) Aldebaran .....	...	22,9	36,5	51,0	4,9	18,9	4.26.33,0	-7,06	B.
	$\alpha$ Herculis .....	43,4	57,7	11,3	25,3	39,1	53,2	17.7.7,1		B.
	$\alpha$ Ophiuchi .....	52,7	7,1	20,8	34,6	48,3	2,1	17.27.15,9		B.
	(b) $\delta$ Ursæ Minoris .....	11.27,2	15.21,3	19.3,3	...	26.39,6	30.24,8	18.34.11,3	+0,29	B.
Jan. 9	$\odot$ 1 L. ....	53,7	9,0	23,3	38,0	52,5	7,2	19.19.21,8		B.
	$\odot$ 2 L. ....	15,2	30,0	44,2	59,3	14,0	28,4	19.21.43,0		B.
	Venus 1 L. ....	9,9	25,0	39,3	54,1	8,8	23,4	19.43.38,0		B.
	$\alpha$ Andromedæ .....	25,4	41,2	56,1	11,8	27,1	42,1	23.59.57,4		B.
	Polaris .....	35.8,6	43.49,4	51.57,7	0.28,2	8.48,5	17.8,8	1.25.31,3		B.
	Aldebaran .....	7,8	22,0	36,0	50,0	4,1	18,2	4.26.32,1		B.
	Rigel .....	16,1	30,1	43,4	57,1	11,1	24,4	5.6.38,1		B.
	$\beta$ Tauri .....	30,0	45,7	0,8	16,1	31,3	46,9	5.16.2,1		B.
	Vesta .....	2,6	17,8	32,0	46,8	1,7	16,1	6.19.30,4		B.
	$\delta$ Ursæ Minoris SP. ....	11.44,3	15.30,7	...	23.3,3	26.53,5	30.35,2	6.34.28,7	-37,93	B.
	$\alpha$ Herculis .....	42,7	57,1	10,7	24,7	38,8	52,5	17.7.6,4		B.
	$\alpha$ Ophiuchi .....	52,1	6,4	20,0	34,0	47,7	2,0	17.27.15,3		B.
	$\delta$ Ursæ Minoris .....	11.28,3	15.22,4	19.3,8	...	26.40,7	30.26,2	18.34.12,7	+0,29	B.
Jan. 10	$\odot$ 1 L. ....	14,9	29,7	44,0	58,9	13,3	28,0	19.23.42,4		B.
	$\odot$ 2 L. ....	36,0	50,8	5,1	20,0	34,4	49,1	19.26.4,1		B.
	$\alpha$ Aquilæ .....	20,1	34,3	47,7	1,5	15,0	28,9	19.42.42,2		B.
	Venus 1 L. ....	31,3	46,4	1,0	15,7	30,4	45,0	19.48.59,5		B.
	$\alpha$ Andromedæ .....	24,9	40,7	55,4	11,0	26,1	41,6	23.59.57,0		B.
	Polaris .....	35.7,2	43.48,2	51.58,2	0.28,3	8.49,2	17.9,6	1.25.28,8		B.
Jan. 12	$\odot$ 1 L. ....	54,2	9,0	23,3	38,2	53,0	7,2	19.32.21,8		B.
	$\odot$ 2 L. ....	15,1	30,0	44,1	59,0	13,8	28,1	19.34.42,4		B.
	$\alpha$ Aquilæ .....	18,3	32,3	45,8	59,6	13,2	26,9	19.42.40,5		B.
	$\alpha$ Andromedæ .....	22,9	38,5	53,8	9,1	24,5	39,4	23.59.55,0		G.
	Polaris .....	...	43.43,2	51.53,8	0.22,8	8.42,6	17.4,0	1.25.23,8	-4.12,39	G.
Jan. 14	Aldebaran .....	2,9	17,3	31,1	45,2	59,1	13,2	4.26.27,1		B.
	Rigel .....	11,3	25,1	38,5	52,3	6,1	19,7	5.6.33,2		B.
	$\beta$ Tauri .....	25,1	40,8	56,1	11,4	27,0	41,9	5.15.57,1		B.
	$\alpha$ Herculis .....	...	...	...	20,1	33,8	48,0	17.7.1,9	-20,94	B.
	$\alpha$ Ophiuchi .....	47,1	1,6	15,1	28,9	42,9	56,8	17.27.10,4		B.
	(c) $\delta$ Ursæ Minoris .....	...	...	...	22.47,5	26.33,7	30.20,4	18.34.7,6	-5.40,64	B.
	$\alpha$ Aquilæ .....	15,3	29,3	42,8	56,4	10,2	23,7	19.42.37,3		B.
Jan. 15	$\odot$ 1 L. ....	48,4	3,7	17,8	32,2	47,0	1,4	19.45.16,0		B.
	$\odot$ 2 L. ....	9,0	24,1	38,1	52,8	7,4	22,0	19.47.36,3		B.
	$\alpha$ Andromedæ .....	...	...	51,0	6,2	21,1	36,4	23.59.52,0	-15,31	B.
	Polaris .....	34.57,5	43.32,8	51.47,6	0.18,3	8.38,2	16.56,7	1.25.19,7		B.
	Aldebaran .....	2,1	16,4	30,3	44,3	58,2	12,4	4.26.26,3		B.
	Rigel .....	10,5	24,1	37,7	51,3	5,1	18,8	5.6.32,2		B.
	$\beta$ Tauri .....	24,2	39,9	55,0	10,4	25,9	41,0	5.15.56,1		B.
	(d) Vesta .....	55,5	11,2	24,8	40,0	54,3	9,1	6.13.24,0		B.
	$\delta$ Ursæ Minoris SP. ....	...	15.24,8	19.11,8	22.55,3	26.46,4	30.29,7	6.34.22,5	-1.53,28	B.
	$\alpha$ Herculis .....	36,8	51,0	4,9	19,0	32,8	46,7	17.7.0,7		B.
	$\alpha$ Ophiuchi .....	46,1	0,8	14,2	28,1	42,0	55,7	17.27.9,5		B.
	(e) Mercury 2 L. ....	...	...	35,4	50,3	4,3	19,1	18.17.33,3	-14,45	B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, ABCDEFG.  
The Transit levelled Jan. 10, 2<sup>h</sup>. and Jan. 17, 2<sup>h</sup>.

(a) Faint and hazy.

(b) Wire IV was written down 22.59,2 probably by a mistake of 5<sup>s</sup>: it is therefore rejected.

(c) Cloudy and very faint.

(d) Misty. The intervals are unsatisfactory.

(e) Very faint and unsteady.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0h.	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
17. 26. 35,09 18. 22. 51,29		+ 2,39	35,67 57,92	26,72 50,77	51,05 52,85	0,62	50,54	17. 27. 26,66 18. 23. 48,93	$\alpha$ Ophiuchi. $\delta$ Ursæ Minoris.
19. 14. 16,56 19. 16. 38,07 19. 37. 31,23 19. 42. 2,81 23. 59. 12,20 1. 0. 24,69 4. 25. 50,81 17. 6. 25,30 17. 26. 34,50 18. 22. 51,54	59,68		27,82 31,73 3,37 12,85 38,94 51,40 25,88 35,08 58,17	54,45 4,10 33,05 42,52 17,54 26,74 50,80	51,08 51,25 54,11 51,12 51,66 51,66 52,63		51,16 51,10	19. 16. 18,86 19. 38. 22,78 19. 42. 54,42 0. 0. 4,01 1. 1. 30,13 4. 26. 42,67 17. 7. 17,46 17. 27. 26,67 18. 23. 49,79	$\odot$ 's center. Venus 1 L. $\alpha$ Aquilæ. $\alpha$ Andromedæ. Polaris. Aldebaran. $\alpha$ Herculis. $\alpha$ Ophiuchi. $\delta$ Ursæ Minoris.
19. 18. 37,93 19. 20. 59,16 19. 42. 54,07 23. 59. 11,58 1. 0. 24,64 4. 25. 50,02 5. 5. 57,19 5. 15. 16,13 6. 18. 46,77 6. 23. 4,69 17. 6. 24,70 17. 26. 33,93 18. 22. 52,64	56,95 60,78		49,05 54,57 12,23 38,89 50,61 57,71 16,78 47,40 58,71 25,28 34,51 59,27	4,09 32,34 42,51 49,56 8,60 50,82 17,56 26,76 50,83	51,86 53,45 51,90 51,85 51,82 52,11 52,28 52,25 51,56		51,78 51,75	19. 20. 40,70 19. 43. 46,23 0. 0. 4,01 1. 1. 30,70 4. 26. 42,51 5. 6. 49,63 5. 16. 8,71 6. 19. 39,36 18. 23. 50,67 17. 7. 17,58 17. 27. 26,84 18. 23. 51,62	$\odot$ 's center. Venus 1 L. $\alpha$ Andromedæ. Polaris. Aldebaran. Rigel. $\beta$ Tauri. Vesta. $\delta$ Ursæ Min. SP. $\alpha$ Herculis. $\alpha$ Ophiuchi. $\delta$ Ursæ Minoris.
19. 22. 58,75 19. 25. 19,92 19. 42. 1,38 19. 48. 15,62 23. 59. 10,95 1. 0. 24,21			9,84 1,94 16,12 11,60 38,46	54,46 4,07 31,64	52,52 52,47 53,18		52,53	19. 25. 2,22 19. 42. 54,33 19. 49. 8,51 0. 0. 4,13 1. 1. 31,02	$\odot$ 's center. $\alpha$ Aquilæ. Venus 1 L. $\alpha$ Andromedæ. Polaris.
19. 31. 38,10 19. 33. 58,93 19. 41. 59,52 23. 59. 9,03 1. 0. 19,31		+ 2,93	49,06 0,11 9,70 32,77	54,48 4,05 30,22	54,37 54,35 57,45	0,97	53,48 54,45	19. 33. 43,33 19. 42. 54,38 0. 0. 4,15 1. 1. 27,26	$\odot$ 's center. $\alpha$ Aquilæ. $\alpha$ Andromedæ. Polaris.
4. 25. 45,13 5. 5. 52,31 5. 15. 11,34 17. 6. 20,01 17. 26. 28,98 18. 22. 46,66 19. 41. 56,43	54,99		45,75 52,86 12,02 20,62 29,59 53,14 57,03	42,49 49,55 8,59 17,69 26,87 50,91 54,51	56,74 56,69 56,57 57,07 57,28 57,77 57,48	0,98 0,91	56,47 56,52	4. 26. 42,40 5. 6. 49,54 5. 16. 8,71 17. 7. 17,79 17. 27. 26,77 18. 23. 50,36 19. 42. 54,30	Aldebaran. Rigel. $\beta$ Tauri. $\alpha$ Herculis. $\alpha$ Ophiuchi. $\delta$ Ursæ Minoris. $\alpha$ Aquilæ.
19. 44. 32,35 19. 46. 52,81 23. 59. 6,03 1. 0. 12,97 4. 25. 44,29 5. 5. 51,38 5. 15. 10,35 6. 12. 39,84 6. 22. 58,47 17. 6. 18,85 17. 26. 28,06 18. 16. 50,03	50,56		43,11 6,71 26,83 44,91 51,93 11,03 40,50 52,72 19,46 28,67 50,56	4,01 27,87 42,49 49,54 8,59 50,94 17,71 26,90	57,30 61,04 57,58 57,61 57,56 58,22 58,25 58,23		57,43 57,46	19. 46. 40,38 0. 0. 4,14 1. 1. 24,36 4. 26. 42,51 5. 6. 49,55 5. 16. 8,66 6. 13. 38,17 18. 23. 50,39 17. 7. 17,49 17. 27. 26,71 18. 17. 48,63	$\odot$ 's center. $\alpha$ Andromedæ. Polaris. Aldebaran. Rigel. $\beta$ Tauri. Vesta. $\delta$ Ursæ Min. SP. $\alpha$ Herculis. $\alpha$ Ophiuchi. Mercury 2 L.

Error of Collimation = +3",25, by the reversion of the Transit on Jan. 23.

Level Error = +4",77. From Jan. 14 = +4",97.

Meridian Error by  $\delta$  Ursæ Minoris,  $\delta$  Ursæ Minoris SP, and  $\delta$  Ursæ Minoris Jan. 8 and 9.

..... from Jan. 12 by  $\delta$  Ursæ Minoris,  $\delta$  Ursæ Minoris SP, and  $\delta$  Ursæ Minoris Jan. 14 and 15.



## TRANSITS OBSERVED IN THE YEAR 1839.

Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Jan. 15	$\delta$ Ursæ Minoris .....	11.22,5	15.15,7	18.58,2	22.46,5	26.32,8	30.19,4	18.34. 5,7		B.
	$\alpha$ Aquilæ .....	14,6	28,9	42,1	55,9	9,4	23,0	19.42. 36,6		B.
Jan. 16	$\odot$ 1 L. ....	6,0	20,5	35,0	49,7	4,1	18,4	19.49. 33,0		B.
	$\odot$ 2 L. ....	26,1	40,7	55,2	10,1	24,5	38,7	19.51. 52,9		B.
	(a) Venus 1 L. ....	.....	.....	.....	2,8	17,0	31,4	20.20. 46,0	- 21,76	B.
	$\alpha$ Andromedæ. ....	18,9	34,7	49,8	5,0	20,2	35,6	23.59. 50,9		B.
	Polaris.....	34.58,4	43.36,7	51.48,5	0.18,6	8.38,3	16.58,4	1.25. 20,7		B.
	Aldebaran. .... (cloudy)	.....	15,7	29,1	43,5	57,8	12,0	4.26. 25,6	- 7,06	B.
	Rigel .....	9,5	23,3	37,1	51,0	4,4	18,1	5. 6. 31,4		B.
	$\beta$ Tauri.....	23,3	39,1	53,9	9,9	25,3	40,4	5.15. 55,6		B.
	$\alpha$ Herculis.....	36,1	50,7	4,1	18,2	32,1	46,1	17. 7. 0,0		B.
	$\alpha$ Ophiuchi.....	46,0	0,1	13,8	27,7	41,3	55,0	17.27. 9,0		B.
	(b) $\delta$ Ursæ Minoris.....	.....	.....	.....	22.47,3	26.32,7	30.20,2	18.34. 4,6	- 5.40,62	B.
Jan. 17	$\odot$ 1 L. }	22,1	37,0	51,1	5,9	20,1	34,9	19.53. 49,3		B.
	$\odot$ 2 L. } .... (very unsteady)	42,1	57,0	11,2	26,0	40,4	55,0	19.56. 9,4		B.
	Polaris .....	35. 5,2	43.36,4	51.48,0	0.19,4	.....	16.57,2	1. ....	+ 6.41,76	G.
	$\alpha$ Arietis .....	23,2	38,1	52,7	7,4	21,9	36,6	1.57. 51,2		G.
	Rigel.....	8,7	22,9	36,3	50,1	3,8	17,3	5. 6. 30,9		G.
	$\beta$ Tauri.....	22,6	38,5	53,5	9,1	24,4	39,6	5.15. 55,0		G.
	$\alpha$ Orionis.....	.....	2,3	15,4	29,3	42,8	56,4	5.46. 10,1	- 6,84	G.
	$\delta$ Ursæ Minoris SP....	11.38,4	15.25,2	... ..	22.56,8	26.47,2	30.28,2	6.34. 21,4	- 37,89	G.
	$\alpha$ Ophiuchi.....	44,8	59,0	12,8	26,7	40,5	54,2	17.27. 8,1		B.
	$\delta$ Ursæ Minoris.....	11.20,4	15.13,7	.....	.....	26.32,5	30.18,3	18.34. 4,2	- 45,33	B.
	$\alpha$ Aquilæ.....	13,1	27,0	40,5	54,1	7,7	21,4	19.42. 35,0		B.
Jan. 18	$\odot$ 1 L. ....	37,8	52,5	6,9	21,4	35,9	50,3	19.58. 4,9		B.
	$\odot$ 2 L. ....	57,4	12,9	26,6	41,3	55,8	10,1	20. 0. 24,5		B.
	$\alpha$ Andromedæ.....	17,1	33,0	47,8	3,5	18,7	33,9	23.59. 49,1		B.
	Polaris.....	34.54,4	43.32,5	51.47,0	0.15,7	8.36,6	16.55,3	1.25. 16,7		B.
	Aldebaran.....	59,4	14,1	28,1	42,0	55,8	10,1	4.26. 23,9		B.
Jan. 19	Polaris.....	34.53,4	43.30,2	51.44,6	0.13,3	8.31,7	16.54,2	1.25. 15,8		B.
	$\alpha$ Arietis.....	21,2	36,2	50,8	5,5	20,1	34,5	1.57. 49,0		B.
	Aldebaran.....	58,4	13,3	26,9	41,2	55,2	9,1	4.26. 23,2		B.
	Rigel.....	7,2	21,0	34,9	48,4	2,4	15,8	5. 6. 29,2		B.
	$\beta$ Tauri.....	20,9	36,6	51,9	7,1	22,4	38,0	5.15. 53,1		B.
	(c) Vesta.....	16,8	31,8	46,4	1,1	15,7	30,1	6. 9. 44,4		B.
	$\delta$ Ursæ Minoris SP....	.....	15.21,7	19. 7,7	22.53,6	26.44,2	30.25,3	6.34. 19,5	- 1.53,27	B.
Jan. 21	$\alpha$ Ophiuchi.....	41,3	55,4	9,1	23,1	36,8	50,9	17.27. 4,6		B.
	$\delta$ Ursæ Minoris .....	.....	15.11,3	18.51,7	22.42,4	26.27,3	.....	18.34. 0,8	- 46,05	B.
	Mercury 2 L.....	58,8	13,4	27,8	42,3	57,2	11,9	18.31. 26,3		B.
	$\alpha$ Aquilæ.....	9,6	23,3	37,0	50,7	4,0	17,8	19.42. 31,1		B.
Jan. 22	$\odot$ 1 L.....	32,3	47,1	1,2	15,8	30,1	44,3	20.15. 58,8		B.
	$\odot$ 2 L.....	51,3	6,0	20,1	35,0	49,1	3,4	20.18. 17,9		B.
	$\alpha$ Andromedæ.. (cloudy)	.....	.....	44,8	59,9	15,1	30,2	0. 0. 45,8	- 15,31	B.
	Polaris.....	35.47,4	44.24,7	52.36,5	... ..	9.27,4	17.47,3	1.26. 9,6	+ 0,64	B.
	$\circ$ Piscium.....	8,8	22,6	36,1	49,9	3,5	17,1	1.37. 30,7		B.
	$\gamma^1$ Arietis.....	55,1	10,1	23,8	38,1	52,2	6,6	1.45. 20,8		B.
	$\alpha$ Arietis.....	18,3	33,3	47,7	2,4	17,1	31,8	1.58. 46,2		B.
	$\delta$ 1 L..... (unsteady)	25,1	40,0	53,9	8,7	22,9	37,3	2. 8. 51,6		B.
	$\pi$ Arietis.....	32,7	47,1	1,1	15,2	29,0	43,1	2.40. 57,2		B.
	$\epsilon$ Arietis.....	13,9	28,6	42,4	57,0	11,8	26,1	2.50. 40,4		B.
	$\alpha$ Ceti.....	7,8	22,0	34,9	48,7	2,1	15,6	2.54. 29,1		B.
	Vesta .....	47,1	2,0	16,6	31,1	46,0	0,6	6. 8. 15,1		B.
Jan. 23	$\delta$ Ursæ Minoris .....	.....	16. 8,7	19.50,6	23.40,4	27.26,7	31.11,5	18. ....	- 0,79	B.
	$\alpha$ Aquilæ .....	7,5	21,6	35,2	48,9	2,2	16,0	19.43. 29,4		B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, *ABCDEFGH*.Transit levelled Jan. 22, 2<sup>h</sup>. Before the observation of the Sun Jan. 22, the clock was put forward 1<sup>m</sup>.Jan. 23, 3<sup>h</sup>. The Transit was twice reversed and levelled three times. The result of the levelling was very nearly the same as that of Jan. 22.

(a) Hurried.

(b) Wire VI was written down 30.30,2

(c) Confused by two stars, one near the planet, the other preceding it a short interval.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
18.22.45,83 19.41.55,79	54,16	+ 2,93	52,31 56,39	50,96 54,52	58,65 58,13	0,80	57,46	18.23.50,38 19.42.54,51	δ Ursæ Minoris. α Aquilæ.
19.48.49,53 19.51.9,74 20.20.2,54 23.59.5,01 1.0.14,23 4.25.43,56 5.5.50,68 5.15.9,65 17.6.18,19 17.26.27,56 18.22.45,58			} 0,17 3,07 5,69 28,09 44,18 51,23 10,33 18,77					19.50.58,29 20.21.1,21 0.0.3,95 1.1.26,38 4.26.42,59 5.6.49,66 5.16.8,77 17.7.17,48	☉'s center. Venus 1 L. α Andromedæ. Polaris. Aldebaran. Rigel. β Tauri. α Herculis.
		+ 2,16	18,77 28,14 52,54	17,74 26,92 51,02	58,97 58,78 58,48	0,78	58,16	17.27.26,87 18.23.51,30	α Ophiuchi. δ Ursæ Minoris.
19.53.5,77 19.55.25,87 1.0.15,00 1.57.7,30 5.5.50,00 5.15.8,96 5.45.29,21 6.22.58,31 17.26.26,59 18.22.44,49 19.41.54,11	53,91		} 16,30 29,98 7,92 50,51 9,62 29,77 51,99 27,17 51,45 54,67					19.55.15,11 1.1.28,95 1.58.6,92 5.6.49,62 5.16.8,73 5.46.28,90 18.23.51,14 17.27.26,89 18.23.51,20 19.42.54,48	☉'s center. Polaris. α Arietis. Rigel. β Tauri. α Orionis. δ Ursæ Min. SP. α Ophiuchi. δ Ursæ Minoris. α Aquilæ.
19.57.21,38 19.59.41,23 23.59.3,30 1.0.11,17 4.25.41,91			} 31,79 3,96 26,15 42,50	3,98 25,21 42,47	60,02 59,06 59,97			19.59.31,61 0.0.3,93 1.1.26,16 4.26.42,64	☉'s center. α Andromedæ. Polaris. Aldebaran.
1.0.9,03 1.57.5,33 4.25.41,04 5.5.48,42 5.15.7,15 6.9.0,90 6.22.55,40		+ 2,74	23,03 5,97 41,64 48,96 7,82 1,55 49,57	24,34 6,84 42,46 49,53 8,58 51,30	61,31 60,87 60,82 60,57 60,76 61,73	0,76	60,63	1.1.23,69 1.58.6,66 4.26.42,41 5.6.49,75 5.16.8,62 6.10.2,38 18.23.50,40	Polaris. α Arietis. Aldebaran. Rigel. β Tauri. Vesta. δ Ursæ Min. SP.
17.26.23,03 18.22.40,65 18.30.42,53 19.41.50,50	48,91 50,96		23,63 47,18 43,05 51,09	27,04 51,63 54,60	63,41 64,45 63,51	0,97	62,63	17.27.26,96 18.23.50,55 18.31.46,43 19.42.54,52	α Ophiuchi. δ Ursæ Minoris. Mercury 2 L. α Aquilæ.
20.15.15,66 20.17.34,69 23.59.59,85 1.1.2,79 1.36.49,82 1.44.38,10 1.58.2,40 2.8.8,50 2.40.15,06 2.49.57,17 2.53.48,60 6.7.31,21			} 25,71 0,52 16,79 50,41 38,72 3,04 9,10 15,68 57,80 49,18 31,86					20.16.29,16 0.0.4,12 1.1.20,43 1.36.54,07 1.44.42,39 1.58.6,72 2.8.12,79 2.40.19,39 2.50.1,51 2.53.52,90 6.7.35,71	☉'s center. α Andromedæ. Polaris. ο Piscium. γ' Arietis. α Arietis. δ 1 L. π Arietis. ε Arietis. α Ceti. Vesta.
18.23.38,79 19.42.48,69			45,32 49,28	51,88 54,63	6,56 5,35	0,89	4,48	18.23.50,48 19.42.54,49	δ Ursæ Minoris. α Aquilæ.

Error of Collimation = + 3",25.

Level Error = + 4",97. From Jan. 19 = + 4",90.

Meridian Error from α Herculis Jan. 16, by δ Ursæ Minoris, δ Ursæ Minoris SP, and δ Ursæ Minoris Jan. 16 and 17.  
 ..... from Jan. 19 by δ Ursæ Minoris SP Jan. 19 and δ Ursæ Minoris Jan. 21, allowing + 2",73 for loss  
 of clock and - 0",33 for change of R.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Jan. 24	☉ 1 L.....	54,7	9,8	23,5	38,0	52,4	6,9	20.24.21,0		B.
	☉ 2 L.....	13,3	28,1	42,2	57,0	11,2	25,3	20.26.39,9		B.
	Venus 1 L.....	35,9	50,6	4,8	19,0	33,3	47,7	21. 3. 1,9		B.
	α Arietis.....	16,8	31,7	46,1	1,0	15,4	30,0	1.58.44,5		G.
	α Ceti.....	6,0	20,0	33,1	46,9	0,4	14,0	2.54.27,3		G.
	☾ 1 L..... (unsteady)	53,2	8,9	23,9	39,8	55,0	10,6	4. 6.25,7		G.
	Rigel.....	2,4	16,4	29,4	43,7	57,1	10,8	5. 7.24,3		G.
	β Tauri.....	.....	32,0	.....	2,4	17,6	33,0	5.16.48,1	- 12,35	G.
Jan. 28	δ Ursæ Minoris.....	12.12,6	16. 4,2	19.46,0	23.36,3	27.21,2	31. 8,4	18.34.52,8		G.
	(a) Mercury 2 L.....	.....	.....	18,8	.....	48,5	2,8	19. 2.17,3	- 18,25	C.
Jan. 29	☉ 1 L.....	37,6	52,0	5,8	20,5	34,7	48,7	20.45. 2,8		C.
	☉ 2 L.....	54,5	9,0	22,8	37,4	51,4	6,0	20.47.20,0		C.
	(b) ξ Cancrī.....	12,7	28,0	42,1	57,0	11,6	26,2	9. 0.40,5		C.
	(c) ☾ 2 L.....	43,4	58,4	12,7	27,8	42,3	57,0	9.11.11,5		C.
	α Hydræ.....	50,6	4,5	17,6	31,5	45,2	58,5	9.20.12,4		C.
	λ Leonis.....	38,5	53,5	8,0	22,6	37,4	52,0	9.23. 7,0		C.
	14 Leonis.....	42,7	57,0	10,3	24,4	38,0	51,6	9.33. 5,3		C.
	Regulus.....	56,8	11,0	24,5	38,4	52,6	6,3	10. 0.20,0		C.
	δ Ursæ Minoris.....	12.11,6	16. 5,4	19.46,0	23.35,8	27.21,2	31. 7,4	18.34.53,2		G.
	α Aquilæ.....	2,7	16,3	29,8	43,7	57,3	11,0	19.43.24,5		C.
	.....	.....	.....	.....	.....	.....	.....	.....		C.
Jan. 30	☉ 1 L.....	43,6	58,3	11,8	26,5	40,7	54,6	20.48. ....	+ 7,09	C.
	☉ 2 L.....	.....	.....	28,8	43,0	57,4	11,7	20.51.26,0	- 14,20	C.
	(d) Venus 1 L..... (cloudy)	40,4	54,8	.....	22,4	36,5	50,6	21.33. 4,8	- 2,37	C.
	α Andromedæ.....	6,5	22,4	37,5	53,0	8,0	23,6	0. 0.38,8		C.
	Polaris.....	35.36,5	44.14,3	52.23,7	0.53,2	9.13,4	17.34,2	1.25.56,0		C.
	(e) α Arietis.....	.....	26,3	41,0	55,6	10,4	25,0	1.58.39,5	- 7,34	C.
Jan. 31	☉ 1 L.....	49,2	3,6	17,6	31,9	45,9	0,5	20.53.14,4		C.
	☉ 2 L.....	5,8	20,2	34,0	48,4	2,8	17,0	20.55.30,9		C.
	α Andromedæ.....	6,0	21,8	36,6	52,2	7,5	22,7	0. 0.38,0		C.
	Polaris..... (cloudy)	35.36,3	44.14,0	.....	0.54,8	9.11,7	17.34,5	1.25.53,4	- 1.24,25	C.
Feb. 1	☉ 1 L.....	53,4	7,7	21,7	36,3	50,4	4,4	20.57.18,5		C.
	☉ 2 L.....	9,7	24,4	38,1	52,5	6,6	20,8	20.59.35,0		C.
	(f) α Aquilæ.....	.....	14,3	27,4	41,3	54,8	8,5	19.43.22,0	- 6,86	C.
Feb. 2	☉ 1 L.....	56,8	11,4	25,2	39,6	53,7	7,7	21. 1.21,8		C.
	(g) ☉ 2 L.....	13,0	27,5	41,4	55,5	9,6	23,7	21. 3.38,0		C.
	(h) Venus 1 L.....	24,8	39,4	52,8	7,3	21,0	34,9	21.47.49,2		C.
Feb. 11	Procyon..... (very unsteady)	50,2	4,2	17,2	31,0	44,5	58,0	7.31.11,7		C.
	(i) Pollux..... (cloudy)	20,3	36,0	.....	.....	.....	.....	7.35. ....	+ 38,37	C.
Feb. 12	Saturn 1 L.}..... (unsteady)	33,1	.....	2,1	.....	31,0	.....	16.31. ....	+ 14,46	G.
	Saturn 2 L.}.....	.....	50,7	.....	19,2	.....	.....	16.31. ....	+ 14,22	G.
	α Herculis.....	12,3	26,7	40,1	54,3	8,1	22,0	17. 7.36,1		G.
	δ Ursæ Minoris.....	.....	15.54,6	19.35,5	23.25,0	27.10,8	30.57,2	18.34.42,7	- 1.53,87	C.
	α Aquilæ..... (unsteady)	49,6	3,7	16,8	30,7	44,4	57,8	19.43.11,6		C.
Feb. 13	☉ 1 L.....	42,4	56,6	10,2	24,4	38,4	51,9	21.45. 5,8		C.
	☉ 2 L.....	56,0	10,2	23,8	38,0	51,8	5,7	21.47.19,4		C.
	Polaris.....	.....	.....	52. 2,2	0.30,7	8.48,4	17. 9,8	1.25.31,4	- 8.21,93	C.
	α Arietis.....	58,0	13,1	27,5	42,1	56,7	11,4	1.58.25,8		C.
	Castor.....	8,4	24,7	40,5	56,6	12,4	28,3	7.24.44,4		C.
	Procyon.....	48,4	2,5	15,7	29,3	42,9	56,5	7.31.10,0		C.
	Pollux.....	18,5	34,4	49,3	4,8	20,2	35,5	7.35.50,9		C.
Feb. 14	(k) ☉ 1 L.....	36,6	50,9	4,4	18,3	32,1	46,0	21.49. 0,0		G.
	☉ 2 L.....	50,0	4,0	17,3	31,9	45,8	59,4	21.51.13,5		G.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, ABCDEFG.

Feb. 4, 23<sup>h</sup>. The Transit levelled.Feb. 23, 4-5<sup>h</sup>. The Transit was levelled in four different positions of the Telescope.

- (a) Hurried and very doubtful. (b) The counting was found 5<sup>s</sup> in advance, and all the wires have been accordingly altered.  
(c) Not good: eye-glass out of focus. (d) Excepting at the last wire, very indistinct. (e) By day-light: wires not well seen.  
(f) Hurried and confused: seconds not taken from clock. (g) Wire III was written down 40,4. My attention was diverted by a singular bright spot near the Limb. (h) Unsteady. After this a long continuation of cloudy weather, and a great change of temperature.  
(i) These two wires were considered good. (k) Faint clouds passing rapidly.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
20.23.38,05 20.25.56,72 21.2.19,03 1.58.0,78 2.53.46,82 4.5.39,59 5.6.43,44 5.16.2,27		+2,74	47,91 19,56 1,42 47,40 40,24 43,98 2,94	6,78 52,82 49,49 8,55	5,36 5,42 5,51 5,61	0,89	4,48 5,37	20.24.53,15 21.2.24,82 1.58.6,86 2.53.52,88 4.5.45,76 5.6.49,54 5.16.8,51	☉'s center. Venus 1 L. α Arietis. α Ceti. 1 L. Rigel. β Tauri.
18.23.34,50 19.1.33,60		+2,68	41,29 34,12	52,45	11,16	0,50	9,43	18.23.51,10 19.1.43,95	δ Ursæ Minoris. Mercury 2 L.
20.44.20,30 20.46.37,30 8.59.56,87 9.10.27,59 9.19.31,47 9.22.22,71 9.32.24,19 9.59.38,52 18.23.34,37 19.42.43,61	42,85 44,08		29,33 57,53 28,22 32,02 23,37 24,79 39,13 41,16 44,21	42,16 49,24 52,60 54,71	10,14 10,11 11,44 10,50		9,93 0,56 9,87	20.45.39,20 9.0.7,65 9.10.38,34 9.19.42,14 9.22.33,50 9.32.34,92 9.59.49,27 18.23.51,46 19.42.54,54	☉'s center. ξ Cancri. 2 L. α Hydræ. λ Leonis. 14 Leonis. Regulus. δ Ursæ Minoris. α Aquilæ.
20.48.26,34 20.50.43,18 21.32.22,55 23.59.52,83 1.0.50,19 1.57.55,63			35,29 23,07 53,51 4,72 56,28	3,84 16,11 6,69	10,33 11,39 10,41		10,43	20.49.45,65 21.32.33,44 0.0.3,94 1.1.15,17 1.58.6,76	☉'s center. Venus 1 L. α Andromedæ. Polaris. α Arietis.
20.52.31,87 20.54.48,45 23.59.52,11 1.0.49,87			40,70 52,79 4,40	3,83 15,28	11,04 10,88	0,76	10,28 11,04	20.53.51,64 0.0.3,83 1.1.15,47	☉'s center. α Andromedæ. Polaris.
20.56.36,06 20.58.52,44 19.42.41,19			44,79 41,79	54,76	12,97	0,91 1,06	11,19 12,10	20.57.56,65 19.42.54,76	☉'s center. α Aquilæ.
21.0.39,46 21.2.55,53 21.47.7,06			48,04 7,59					21.2.1,07 21.47.20,65	☉'s center. Venus 1 L.
7.30.30,97 7.35.6,52		+1,66	31,51 7,18	53,88 29,31	22,37 22,13	0,88	21,97	7.30.53,76 7.35.29,43	Procyon. Pollux.
16.31.16,53 16.31.19,17 17.6.54,23 18.23.23,76 19.42.30,65	32,55		18,31 54,82 31,50 31,22	18,49 55,48 54,96	23,67 23,98 23,74	0,89	22,85	16.31.41,77 17.7.18,30 18.23.55,03 19.42.54,80	Saturn's center. α Herculis. δ Ursæ Minoris. α Aquilæ.
21.44.24,24 21.46.37,85 1.0.26,57 1.57.42,08 7.23.56,47 7.30.29,33 7.35.4,80			31,53 43,27 42,71 57,17 29,88 5,48	6,38 6,50 21,10 53,87 29,30	23,11 23,79 23,93 23,99 23,82		23,74	21.45.55,19 1.1.7,05 1.58.6,52 7.24.21,18 7.30.53,90 7.35.29,50	☉'s center. Polaris. α Arietis. Castor. Procyon. Pollux.
21.48.18,33 21.50.31,70		+1,83	25,51			0,85	23,80	21.49.50,09	☉'s center.

Error of Collimation = +3",25.

Level Error = +4",90. From Jan. 28 = +5",13. From Feb. 12 = +5",47, the mean of four levellings.

Meridian Error by δ Ursæ Minoris and α Aquilæ Jan. 21 = +1",24; by the same stars Jan. 29 = +1",18. That adopted from Jan. 28 is the last used diminished by 0",06, the difference of the above.

Meridian Error from Feb. 11 by δ Ursæ Minoris; Feb. 12 and δ Ursæ Minoris SP Feb. 14, allowing +1",30 for loss of clock and -0",38 for change of R.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Feb. 14	$\beta$ Tauri .....	56,8	12,3	27,5	43,0	58,2	13,6	5. 16. 28,8		G.
	$\alpha$ Orionis .....	22,4	36,2	49,5	3,3	16,9	30,5	5. 46. 44,0		G.
	(a) Vesta .....	.....	.....	19,2	34,5	49,2	4,1	5. 58. ....	- 7,42	G.
	$\delta$ Ursæ Minoris SP... 12.18,3	16. 4,6	19.50,5	23.36,0	27.26,2	31. 7,4	6. 35. 0,8			G.
	Castor .....	7,4	23,9	39,4	55,8	11,6	27,6	7. 24. 43,3		G.
	Procyon .....	47,4	1,4	14,5	28,3	42,0	55,2	7. 31. 9,1		G.
	Pollux .....	17,7	33,2	48,2	4,0	19,1	34,4	7. 35. 49,5		G.
	Saturn 1 L .....	59,3	.....	28,2	.....	57,2	.....	16. 31. ....	+ 14,46	G.
	Saturn 2 L .....	.....	17,1	.....	45,6	.....	.....	16. 31. ....	+ 14,22	G.
	$\delta$ Ursæ Minoris .. (faint)	.....	15.53,6	19.35,6	.....	27.10,5	30.54,8	18. 34. 41,3	- 2. 16,28	G.
	$\alpha$ Aquilæ .....	47,9	2,0	15,2	29,1	42,7	56,2	19. 43. 9,9		G.
	Mercury 2 L .....	4,8	19,4	33,5	48,1	2,6	.....	20. 40. ....	+ 14,41	G.
Feb. 15	$\odot$ 1 L .....	29,8	44,1	57,7	11,7	25,7	39,4	21. 52. 53,3		G.
	$\odot$ 2 L .....	43,2	57,5	11,0	25,1	38,9	52,8	21. 55. 6,8		G.
	$\alpha$ Andromedæ .....	51,4	7,2	22,0	37,7	53,0	8,1	0. 0. 23,4		C.
	Polaris .....	35.10,4	43.47,7	51.58,3	0.27,8	.....	.....	1. 25. 28,0	+ 5. 1,25	C.
	$\alpha$ Ceti .....	45,5	59,5	12,7	26,5	40,0	53,3	2. 54. 6,7		C.
	$\alpha$ Orionis .....	21,6	35,3	48,8	2,8	16,2	29,9	5. 46. 43,2		G.
	Vesta .....	47,6	2,6	17,3	32,1	47,0	.....	5. 57. ....	+ 14,81	G.
	$\delta$ Ursæ Minoris SP... 12.18,4	16. 4,0	19.49,5	23.36,0	27.25,7	.....	.....	6. 35. 0,2	+ 1. 14,99	G.
	Castor .....	6,7	22,9	38,7	55,0	10,9	26,6	7. 24. 42,4		G.
	Procyon .....	46,8	0,9	14,0	27,8	41,0	54,6	7. 31. 8,1		G.
	Pollux .....	17,0	32,6	47,6	3,1	18,5	33,7	7. 35. 49,0		G.
Feb. 16	(b) $\odot$ 1 L .....	22,4	36,5	50,1	4,2	17,8	31,8	21. 56. 45,6		C.
	$\odot$ 2 L .....	35,3	49,5	3,0	17,0	30,7	44,6	21. 58. 58,6		C.
	(c) Venus 1 L .....	47,8	2,0	15,4	39,3	52,8	6,6	22. 54. 20,2		C.
	$\alpha$ Andromedæ .....	50,8	6,4	21,5	36,8	52,0	7,4	0. 0. 22,5		C.
	Rigel .....	41,0	55,2	8,7	22,5	36,1	49,7	5. 7. 3,1		G.
	$\beta$ Tauri .....	55,0	10,9	25,7	41,6	56,8	12,2	5. 16. 27,5		G.
	Vesta .....	47,0	2,4	16,6	31,9	46,8	.....	5. 57. ....	+ 14,82	G.
	$\delta$ Ursæ Minoris SP... ..	16. 2,8	19.48,6	23.34,5	27.25,4	.....	.....	6. ....	+ 1. 53,48	G.
	Castor .....	5,9	22,2	37,9	54,1	10,0	26,0	7. 24. 41,8		G.
	Procyon .....	46,0	59,9	13,2	27,0	40,2	54,0	7. 31. 7,5		G.
	Pollux .....	16,0	31,8	46,9	2,4	17,6	32,8	7. 35. 48,2		G.
Feb. 18	Vesta .....	52,0	7,4	21,9	36,8	51,8	.....	5. 57. ....	+ 14,82	G.
	(d) $\delta$ Ursæ Minoris SP... 12.13,5	16. 1,4	19.45,0	23.30,8	27.23,0	31. 1,4	6. 34. 57,6			G.
	Castor .....	.....	.....	36,4	52,6	8,3	24,4	7. 24. 40,3	- 15,97	G.
	Procyon .....	44,2	58,1	11,6	25,0	38,8	52,1	7. 31. 5,8		G.
	Pollux .....	14,4	30,1	45,0	0,8	15,7	31,0	7. 35. 46,6		G.
Feb. 19	$\delta$ 1 L .....	50,0	5,2	19,7	34,8	49,6	4,2	2. 47. 19,0		B.
	$\alpha$ Ceti .....	41,9	56,1	9,2	22,7	36,2	49,7	2. 54. 3,1		B.
	$\beta$ Tauri .....	52,1	8,0	22,8	38,3	54,0	9,1	5. 16. 24,2		B.
	$\alpha$ Orionis .....	18,0	31,7	45,1	58,9	12,5	26,0	5. 46. 39,5		B.
	Vesta .....	57,0	12,3	26,8	42,0	56,7	11,3	5. 58. 26,1		B.
	$\delta$ Ursæ Minoris SP... 12.14,3	16. 0,8	19.46,7	.....	.....	.....	.....	6. 34. 56,6	+ 2. 49,15	B.
	$\alpha$ Aquilæ .....	.....	.....	.....	.....	.....	.....	.....		B.
Feb. 20	$\alpha$ Orionis .....	17,0	30,6	44,1	58,1	11,3	25,1	5. 46. 38,7		B.
	Vesta .....	4,0	19,2	34,0	48,9	3,8	18,5	5. 58. 33,1		B.
	$\delta$ Ursæ Minoris SP... 12.14,5	15.58,3	19.44,8	23.31,2	27.21,3	31. 3,2	6. 34. 54,7			B.
	Castor .....	2,4	18,7	34,1	50,0	6,1	21,9	7. 24. 38,0		B.
	Procyon } .....	42,0	56,0	9,4	23,1	36,6	50,2	7. 31. 3,6		B.
	Pollux } .....	12,1	27,8	43,0	58,3	13,8	29,0	7. 35. 44,1		B.
	$\delta$ Ursæ Minoris .....	.....	.....	.....	.....	27. 6,4	30.53,5	18. 34. 39,7	- 7. 33,05	B.
Feb. 21	$\alpha$ Aquilæ .....	42,4	56,5	10,1	23,7	37,2	50,9	19. 43. 4,6		B.
	(e) $\odot$ 1 L .....	.....	.....	.....	16,0	29,8	43,2	22. 15. 57,0	- 20,67	B.
	(e) $\odot$ 2 L .....	.....	1,1	14,0	.....	42,1	55,8	22. 18. 9,3	- 8,26	B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, ABCDEFG.

(a) Much hurried.

(b) 1 L unsteady; 2 L remarkably tremulous and ragged.

(c) Unsteady. The first four wires have each been diminished 10".

(d) Extremely unsteady.

(e) Very faintly seen through haze and clouds.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>//</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
5.15.42,88	29,36	+1,83	43,57	8,33	24,76	0,85	24,65	5.16.8,41	$\beta$ Tauri.
5.46.3,26			3,83	28,71	24,88			5.46.28,69	$\alpha$ Orionis.
5.57.34,33			34,99	...	...			5.57.59,85	Vesta.
6.23.37,69			30,71	55,86	25,15			18.23.55,59	$\delta$ Ursæ Min. SP.
7.23.55,57			56,28	21,10	24,82			7.24.21,19	Castor.
7.30.28,27	31,67		28,83	53,87	25,04	0,78	24,68	7.30.53,75	Procyon.
7.35.3,73			4,41	29,30	24,89			7.35.29,33	Pollux.
16.31.42,69			44,60	...	...			16.32.9,84	Saturn's center.
16.31.45,57				...	...			...	...
18.23.22,88			30,51	56,00	25,49			18.23.55,79	$\delta$ Ursæ Minoris.
19.42.29,00	28,96		29,58	55,00	25,42	0,74	25,44	19.42.54,90	$\alpha$ Aquilæ.
20.39.48,09			48,56	...	...			20.40.13,91	Mercury 2 L.
21.52.11,67			18,85	...	...			...	...
21.54.25,04				...	...			21.53.44,24	$\odot$ 's center.
23.59.37,55			38,24	3,72	25,48			0.0.3,70	$\alpha$ Andromedæ.
1.0.23,69	28,96		40,15	4,90	24,75	25,46	25,46	1.1.5,64	Polaris.
2.53.26,32			26,87	52,53	25,66			2.53.52,42	$\alpha$ Ceti.
5.46.2,54			3,11	28,70	25,59			5.46.28,76	$\alpha$ Orionis.
5.57.32,13			32,79	...	...			5.57.58,44	Vesta.
6.23.37,29			30,31	56,14	25,83			18.23.55,98	$\delta$ Ursæ Min. SP.
7.23.54,74	28,96		55,45	21,09	25,64	...	...	7.24.21,15	Castor.
7.30.27,60			28,16	53,86	25,70			7.30.53,86	Procyon.
7.35.3,07			3,75	29,29	25,54			7.35.29,46	Pollux.
21.56.4,06			11,00	...	...			...	...
21.58.16,95				...	...			21.57.37,12	$\odot$ 's center.
22.53.39,16	28,96		39,67	...	...	0,74	25,44	22.54.5,82	Venus 1 L.
23.59.36,77			37,46	3,71	26,25			0.0.3,64	$\alpha$ Andromedæ.
5.6.22,33			22,84	49,23	26,39			5.6.49,18	Rigel.
5.15.41,38			42,07	8,30	26,23			5.16.8,41	$\beta$ Tauri.
5.57.31,76			32,42	...	...			5.57.58,79	Vesta.
6.23.36,31	28,96		29,33	56,43	27,10	26,18	26,18	18.23.55,71	$\delta$ Ursæ Min. SP.
7.23.53,99			54,70	21,08	26,38			7.24.21,11	Castor.
7.30.26,83			27,39	53,86	26,47			7.30.53,80	Procyon.
7.35.2,24			2,92	29,29	26,37			7.35.29,33	Pollux.
5.57.36,80			...	...	...			...	...
6.23.33,24	28,96	+3,43	37,52	...	...	1,10	27,68	5.58.5,47	Vesta.
7.23.52,43			27,44	57,04	29,60			18.23.55,41	$\delta$ Ursæ Min. SP.
7.30.25,09			53,18	21,07	27,89			7.24.21,20	Castor.
7.35.0,51			25,73	53,85	28,12			7.30.53,75	Procyon.
...			1,24	29,28	28,04			7.35.29,27	Pollux.
2.46.34,64	24,44		35,33	...	...	1,14	28,87	2.47.4,33	$\gamma$ 1 L.
2.53.22,70			23,33	52,47	29,14			2.53.52,34	$\alpha$ Ceti.
5.15.38,56			39,30	8,25	28,95			5.16.8,42	$\beta$ Tauri.
5.45.58,82			59,46	28,65	29,19			5.46.28,61	$\alpha$ Orionis.
5.57.41,74			42,46	...	...			5.58.11,61	Vesta.
6.23.33,75	28,74		27,95	57,33	29,38	1,09	29,88	18.23.57,12	$\delta$ Ursæ Min. SP.
5.45.57,85			58,48	28,64	30,16			5.46.28,62	$\alpha$ Orionis.
5.57.48,79			49,50	...	...			5.58.19,65	Vesta.
6.23.32,57			26,97	57,60	30,63			18.23.57,14	$\delta$ Ursæ Min. SP.
7.23.50,17			50,91	21,06	30,15			7.24.21,13	Castor.
7.30.22,98	28,74		23,61	53,84	30,23	1,22	29,88	7.30.53,83	Procyon.
7.34.58,30			59,02	29,27	30,25			7.35.29,24	Pollux.
18.23.20,15			26,57	57,73	31,16			18.23.57,38	$\delta$ Ursæ Minoris.
19.42.23,34			23,98	55,13	31,15			19.42.54,86	$\alpha$ Aquilæ.
22.15.15,83			22,61	...	...			...	...
22.17.28,21				...	...			22.16.53,62	$\odot$ 's center.

Error of Collimation = +3",25. From Feb. 20 = +3",07. See Introduction.

Level Error = +5",47.

Meridian Error from Feb. 14 by  $\delta$  Ursæ Minoris SP,  $\delta$  Ursæ Minoris, and  $\delta$  Ursæ Minoris SP Feb. 14 and 15.

..... from Feb. 18 by  $\delta$  Ursæ Minoris SP and  $\delta$  Ursæ Minoris Feb. 20, allowing +0",53 for loss of clock and -0",13 for change of  $\mathcal{R}$ .



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Feb. 21	(a) Venus 1 L.....	.....	.....	.....	41,0	54,3	8,0	23.17.21,7	- 20,44	B.
	) 1 L..... (hazy)	17,1	33,2	48,4	4,4	20,1	35,8	4.49.51,3		B.
	Rigel .....	36,1	50,2	3,8	....	31,3	44,7	5.6.58,1	+ 0,02	B.
	β Tauri.....	50,0	5,7	20,8	36,2	51,5	7,1	5.16.22,2		B.
Feb. 22	(b) Mercury 2 L.....	26,4	41,2	54,8	9,4	23,6	37,2	21.31.51,4		B.
Feb. 23	Aldebaran.....	25,3	39,7	53,9	8,1	22,0	35,9	4.26.50,1		B.
	β Tauri.....	47,4	3,3	18,1	34,0	49,1	4,8	5.16.19,9		B.
	(c) ε Geminorum.....	.....	.....	14,0	29,0	43,6	58,3	6.34.13,3	- 14,91	B.
	) 1 L.....	45,0	0,9	16,1	32,1	47,7	3,3	6.55.19,0		B.
	ε Geminorum.....	25,4	40,2	55,1	11,1	25,9	41,0	7.15.56,3		B.
	Castor..... (very cloudy)	.....	.....	31,4	46,7	3,0	18,6	7.24.34,3	- 15,95	B.
	Procyon..... (blazing)	38,5	52,4	6,0	19,4	33,2	46,4	7.31.0,2		B.
	Pollux.....	8,8	24,2	39,2	55,1	10,2	25,4	7.35.40,9		B.
	α Hydræ.....	26,9	41,1	54,0	8,1	21,5	35,0	9.19.48,7		B.
	Regulus.....	33,1	47,1	1,0	14,9	29,1	42,8	9.59.56,5		B.
	β Leonis.....	35,5	50,2	4,1	18,1	31,8	46,1	11.41.0,1		B.
	Mars 2 L..... (unsteady)	16,9	30,5	44,2	57,9	11,4	24,7	11.54.38,3		B.
Feb. 24	(c) ε Geminorum.....	.....	.....	54,0	10,0	24,9	40,0	7.15.55,4	- 15,29	B.
	Saturn 1 L.....	46,3	.....	15,0	.....	44,0	.....	16.34.12,8	+ 0,07	B.
	Saturn 2 L.....	.....	4,3	.....	32,5	.....	1,4	16.34. ....	- 0,10	B.
	α Aquilæ.....	38,1	52,0	5,5	19,2	32,7	46,3	19.42.0,1		B.
Feb. 25	Aldebaran.....	23,4	38,1	52,3	6,0	19,8	34,2	4.26.48,1		B.
	α Orionis.....	.....	.....	.....	52,4	6,1	19,6	5.46.33,2	- 20,43	B.
	Vesta.....	7,4	23,1	37,1	52,2	7,3	22,1	5.59.36,9		B.
	δ Ursæ Minoris SP....	12.8,3	15.54,4	19.39,7	23.26,3	27.17,5	30.57,7	6.34.51,5		B.
	(c) ε Geminorum.....	.....	38,9	53,2	8,7	23,9	39,0	7.15.54,2	- 7,67	B.
	Castor.....	56,5	13,0	28,4	44,7	0,6	16,5	7.24.32,3		B.
	(c) Procyon.....	36,4	.....	4,0	17,6	31,1	44,5	7.30.58,1	- 4,49	B.
	(c) Pollux.....	6,4	22,1	.....	53,0	8,2	23,4	7.35.38,8	- 2,58	B.
	λ Cancri.....	38,1	53,0	7,7	22,8	37,6	52,3	8.11.7,0		B.
	γ Cancri.....	39,4	54,1	8,9	23,6	38,4	52,5	8.34.7,1		B.
	(c) ) 1 L.....	3,3	18,0	32,7	47,9	2,6	17,4	8.49.32,1		B.
	(c) α Hydræ.....	.....	39,0	.....	6,0	19,7	33,1	9.19. ....	- 3,48	B.
	λ Leonis.....	12,9	28,0	42,2	57,1	11,9	27,1	9.22.41,1		B.
	14 Leonis.....	17,2	31,1	44,8	59,0	12,4	26,2	9.32.39,9		B.
	Regulus.....	31,1	45,3	59,1	13,1	27,0	40,7	9.59.54,3		B.
	β Leonis.....	34,0	48,4	2,1	16,3	30,0	44,1	11.40.58,0		B.
	Mars 2 L.....	3,6	17,7	30,6	44,4	58,0	11,7	11.52.25,2		B.
	Saturn 1 L.....	54,6	.....	23,5	.....	52,8	.....	16.34.21,2	+ 0,07	B.
	Saturn 2 L.....	.....	12,8	.....	41,3	.....	10,0	16.34. ....	- 0,10	B.
Feb. 26	⊙ 1 L.....	28,7	42,8	56,1	10,1	23,6	37,4	22.34.51,1		B.
	⊙ 2 L.....	40,1	54,2	7,7	21,6	35,1	48,9	22.37.2,5		B.
	(d) Venus 1 L.....	.....	57,7	11,2	25,1	39,0	52,3	23.40.5,9	- 6,80	B.
	) 1 L.....	7,6	22,2	36,4	51,0	5,3	19,9	9.40.34,1		B.
	Regulus.....	30,4	44,5	58,1	12,2	26,1	39,7	9.59.53,3		B.
	γ Leonis.....	46,7	1,4	15,2	30,1	44,1	58,7	10.11.13,2		B.
	β Leonis.....	33,1	47,1	0,9	15,0	28,8	43,0	11.40.57,0		B.
	Mars 2 L.....	53,5	7,4	20,9	34,8	47,8	1,6	11.51.15,1		B.
	δ Ursæ Minoris.....	11.52,6	15.45,4	19.27,5	23.17,4	27.2,2	30.47,6	18.34.34,3		B.
Feb. 27	(c) ⊙ 1 L.....	14,0	.....	.....	.....	8,9	23,0	22.38.36,1	- 10,22	B.
	⊙ 2 L.....	25,3	.....	.....	6,7	20,1	33,9	22.40.47,5	- 8,20	B.
	Rigel.....	30,0	44,0	57,1	11,1	24,4	37,9	5.6.51,9		B.
	β Tauri.....	43,9	59,2	14,1	30,0	45,1	0,6	5.16.16,0		B.
	α Orionis.....	9,3	23,1	36,3	50,2	4,0	17,4	5.46.31,0		B.
	Vesta.....	46,0	1,1	15,8	30,8	45,9	0,4	6.0.15,1		B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, *ABCDEFGH*.

(a) Very faintly seen through haze and clouds.  
 (b) Hazy and unsteady.  
 (c) Cloudy.

(d) Hurried. The counting was found 30" in advance,  
 and the observation is accordingly altered.  
 (e) Embarrassed by clouds passing rapidly.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock. Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
23.16.40,81 4.49.44,7 5.6.17,39 5.15.36,22		+3,43	41,41 5,18 17,98 36,95	49,15 8,22	31,17 31,27	1,22	29,88 31,10	23.17.12,48 4.49.36,52 5.6.49,34 5.16.8,32	Venus 1 L. ) 1 L. Rigel. β Tauri.
21.31.9,15 4.26.7,86 5.15.33,80 6.33.28,73 6.54.32,01 7.15.10,71 7.23.46,85 7.30.19,45 7.34.54,83 9.19.7,90 9.59.14,93 11.40.17,99 11.53.57,70			9,74 8,52 34,53 29,44 32,72 11,44 47,59 20,08 55,55 8,50 15,58 18,65 58,33	42,03 8,19 21,03 53,81 29,24 42,32 49,54 52,55	33,51 33,66 33,44 33,75 33,69 33,82 33,96 33,90	1,06	32,30 33,36	21.31.42,99 4.26.42,07 5.16.8,12 6.34.3,09 6.55.6,39 7.15.45,12 7.24.21,28 7.50.53,77 7.35.29,25 9.19.42,27 9.59.49,38 11.40.52,52 11.54.32,22	Mercury 2 L. Aldebaran. β Tauri. ε Geminorum. ) 1 L. ε Geminorum. Castor. Procyon. Pollux. α Hydræ. Regulus. β Leonis. Mars 2 L.
7.15.9,57 16.33.29,60 16.33.32,63 19.41.19,13		+3,64	10,30 31,71 19,78	55,22	35,44	1,02	34,36	7.15.44,97 16.34.6,77 19.41.54,98	ε Geminorum. Saturn's center. α Aquilæ.
4.26.5,99 5.45.52,40 5.58.52,30 6.23.27,91 7.15.8,65 7.23.44,57 7.30.17,46 7.34.52,74 8.10.22,64 8.33.23,43 8.48.47,72 9.19.5,97 9.21.57,19 9.31.58,66 9.59.12,94 11.40.16,13 11.51.44,46 16.33.38,10 16.33.41,27			6,66 53,04 53,01 22,47 9,38 45,32 18,10 53,47 23,35 24,12 48,40 6,58 57,90 59,31 13,60 16,80 45,10 40,28	42,00 28,57 58,90 21,00 53,79 29,22 42,32 49,55 52,58	35,34 35,53 36,43 35,68 35,69 35,75 35,74 35,95 35,78	35,38	4.26.42,23 5.46.28,67 5.59.28,64 18.23.58,12 7.15.45,07 7.24.21,01 7.30.53,80 7.35.29,17 8.10.59,08 8.33.59,86 8.49.24,15 9.19.42,36 9.22.33,68 9.32.35,09 9.59.49,40 11.40.52,68 11.52.20,98	Aldebaran. α Orionis. Vesta. δ Ursæ Min. SP. ε Geminorum. Castor. Procyon. Pollux. λ Cancri. γ Cancri. ) 1 L. α Hydræ. λ Leonis. 14 Leonis. Regulus. β Leonis. Mars 2 L.	
22.34.9,97 22.36.21,44 23.39.25,07 9.39.50,92 9.59.12,04 10.10.29,91 11.40.14,99 11.50.34,44 18.23.15,29	23,88		16,31 25,68 51,59 12,70 30,59 15,66 35,08 21,58	52,59 59,34	36,85 36,93 37,76	1,03	35,39	16.34.16,38	Saturn's center.
22.37.55,28 22.40.6,50 5.6.10,91 5.15.29,84 5.45.50,18 5.59.30,73			1,50 11,51 30,57 50,82 31,44	49,05 8,12 28,54	37,54 37,55 37,72	0,93	36,43	22.35.52,67 23.40.2,09 9.40.28,43 9.59.49,55 10.11.7,45 11.40.52,58 11.51.12,01 18.23.58,72	☉'s center. Venus 1 L. ) 1 L. Regulus. γ Leonis. β Leonis. Mars 2 L. δ Ursæ Minoris.
							37,36	5.6.49,07 5.16.8,14 5.46.28,40 6.0.9,03	☉'s center. Rigel. β Tauri. α Orionis. Vesta.

Error of Collimation = + 3",07.

Level Error = + 5",47.

Meridian Error from Feb. 24 by δ Ursæ Minoris, δ Ursæ Minoris SP, and δ Ursæ Minoris Feb. 26 and 27.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Feb. 27	δ Ursæ Minoris SP....	12. 7,2	15.53,2	19.40,5	23.25,8	27.15,3	30.57,2	6. 34. 49,2		B.
	Castor.....	54,7	11,0	26,5	42,8	59,0	14,8	7. 24. 30,4		B.
	Procyon.....	34,8	48,4	2,1	15,6	29,2	42,9	7. 30. 56,2		B.
	Pollux.....	4,8	20,3	35,1	51,0	6,1	21,4	7. 35. 37,0		B.
	λ Cancri.....	36,6	51,1	5,7	20,9	35,5	50,3	8. 11. 5,1		B.
	γ Cancri.....	37,2	52,1	6,6	21,3	36,0	50,3	8. 34. 5,1		B.
	α Hydræ.....	23,0	37,0	50,3	4,2	17,9	31,1	9. 19. 45,2		B.
	λ Leonis.....	11,1	25,7	40,1	55,1	10,0	24,5	9. 22. 39,1		B.
	14 Leonis.....	15,2	29,2	42,9	56,7	10,3	24,0	9. 32. 37,7		B.
	Regulus.....	29,4	43,6	57,2	11,2	25,0	38,7	9. 59. 52,6		B.
	γ Leonis.....	45,4	0,1	14,4	29,0	43,2	57,9	10. 11. 12,1		B.
	δ 1 L..... (cloudy)	43,2	57,7	11,4	25,4	40,0	53,7	10. 28. 7,7		B.
	(a) δ 2 L.....	50,0	4,4	18,2	32,3	46,2	0,3	10. 30. 14,3		B.
	ι Leonis.....	29,7	43,6	57,1	11,1	24,8	38,8	10. 40. 52,1		B.
	χ Leonis.....	25,1	38,8	52,1	6,0	19,7	33,2	10. 56. 47,0		B.
	β Leonis.....	32,1	46,3	0,1	14,0	28,1	41,9	11. 40. 55,8		B.
	Mars 2 L.....	41,4	55,5	8,8	22,4	35,9	49,6	11. 50. 2,5		B.
	δ Ursæ Minoris.....	11.53,7	15.44,8	19.26,7	23.16,6	27. 2,7	30.47,2	18. 34. 33,5		B.
	α Aquilæ.....	35,1	49,0	2,7	16,3	30,0	43,9	19. 42. 57,1		B.
Feb. 28	⊙ 1 L.....	59,2	13,0	25,9	39,8	53,2	7,1	22. 42. 20,7		B.
	⊙ 2 L..... (Temp. 41°)	10,0	23,7	37,1	51,1	4,5	18,4	22. 44. 32,1		B.
	(b) Venus 1 L.....	46,9	0,9	14,0	27,5	41,0	54,8	23. 49. 8,2		B.
	χ Leonis.....	23,8	38,2	51,1	5,0	18,7	32,1	10. 56. 46,0		B.
	δ 2 L.....	50,1	4,6	18,0	32,0	45,8	59,5	11. 15. 13,3		B.
	β Leonis.....	31,1	45,0	59,1	13,1	27,2	41,1	11. 40. 55,0		B.
	Mars 2 L.....	26,9	40,8	54,3	7,8	21,6	34,9	11. 48. 48,5		B.
Mar. 1	α Orionis.....	7,1	21,1	34,4	48,2	2,0	15,3	5. 46. 29,0		B.
	δ Ursæ Minoris SP....	12. 7,8	15.53,6	19.40,5	23.23,3	27.14,7	30.56,4	6. 34. 48,8		B.
	Regulus..... (Temp. 42°)	27,2	41,6	55,0	9,0	22,8	36,8	9. 59. 50,4		B.
	Mars 2 L.....	10,7	24,6	37,8	51,5	4,8	18,8	11. 47. 32,2		B.
	δ 2 L.....	22,4	36,7	50,1	4,3	17,9	31,6	11. 58. 45,3		B.
	η Virginis.....	20,8	34,9	48,2	1,8	15,2	28,7	12. 11. 42,1		B.
Mar. 4	(c) ⊙ 1 L.....	51,3	5,1	18,7	32,4	46,0	59,8	22. 57. 13,4		B.
	⊙ 2 L..... (Temp. 42°)	2,1	16,0	29,3	43,1	56,7	10,3	22. 59. 23,9		B.
Mar. 6	ε Geminorum.....	32,1	47,8	2,2	17,1	32,1	46,9	6. 34. 2,0		B.
	Castor.....	47,3	3,7	19,2	35,3	51,2	7,1	7. 24. 23,0		B.
	Procyon.....	27,2	41,0	54,1	8,2	21,7	35,1	7. 30. 48,6		B.
	Pollux.....	57,2	13,1	28,0	43,6	59,0	14,1	7. 35. 29,9		B.
	α Hydræ.....	15,7	29,8	43,4	57,0	10,2	23,9	9. 19. 37,3		B.
	Regulus..... (Temp. 39°)	22,1	36,1	49,8	4,0	17,8	31,3	9. 59. 45,1		B.
	ι Leonis.....	22,1	36,1	49,8	3,9	17,4	31,2	10. 40. 45,1		B.
	Mars 2 L.....	23,0	36,8	50,3	4,4	17,7	31,3	11. 40. 44,8		B.
Mar. 8	⊙ 1 L.....	36,9	50,8	4,1	17,8	31,3	44,9	23. 11. 58,4		B.
	⊙ 2 L.....	47,1	1,0	14,1	28,0	41,3	55,0	23. 14. 8,7		B.
	Venus 1 L..... (cloudy)	.....	59,0	12,3	26,0	39,4	53,0	0. 25. 6,9	- 6,79	B.
	Aldebaran.....	11,7	26,0	39,8	54,0	8,1	22,2	4. 26. 36,1		B.
	Rigel.....	.....	34,0	47,2	1,1	14,8	28,1	5. 6. ....	- 0,03	B.
	β Tauri.....	33,4	49,3	4,6	20,2	35,4	50,6	5. 16. 6,1		B.
	α Orionis.....	59,3	13,4	26,8	40,4	54,1	7,7	5. 46. 21,2		B.
	Vesta.....	1,8	16,8	31,1	46,4	1,6	16,1	6. 4. 30,9		B.
	Castor.....	44,8	1,3	16,9	33,0	48,7	4,8	7. 24. 20,9		B.
	Procyon.....	24,8	38,7	51,8	5,9	19,4	33,1	7. 30. 46,6		B.
	Pollux.....	.....	11,0	25,8	41,1	56,3	11,9	7. 35. 27,1	- 7,69	B.
	Regulus.....	19,8	34,1	47,3	1,6	15,4	29,1	9. 59. 42,8		B.
	(d) Mars 2 L.....	30,2	44,0	57,4	11,6	24,8	38,2	11. 37. 51,7		B.
	β Leonis.....	22,4	36,6	50,4	4,7	18,3	32,4	11. 40. 46,2		B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, *ABCDEFGH*.  
Transit levelled March 4, 2<sup>3</sup><sub>4</sub><sup>h</sup>. and March 11, 2<sup>1</sup><sub>2</sub><sup>h</sup>.

- (a) The correction +0<sup>s</sup>.09 is applied to the apparent  
R of 2 L for defect of illumination.  
(b) Cloudy and unsteady.

- (c) Very unsteady. After this day, a considerable  
change of temperature.  
(d) Hurried.





Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Mar. 9	☉ 1 L.}	17,1	31,1	44,0	58,1	11,8	25,1	23.15.38,8		B.
	☉ 2 L.} ..... (very cloudy)	27,2	41,1	54,4	.....	.....	.....	23.16. ....	+ 27,17	
	Polaris .....	43,17,8	51,29,5	0. 0,4	8,16,8	16,35,8	1.24.57,4	- 4.11,53		
	Castor .....	43,7	59,9	15,4	31,6	47,4	3,7	7.24.19,4		
	Procyon.....	23,5	37,3	50,9	4,5	18,0	31,3	7.30.45,1		
	Pollux .....	54,0	9,9	24,2	40,1	55,2	10,9	7.35.26,0		
	α Hydræ .....	12,1	26,1	39,1	53,0	6,7	20,1	9.19.33,7		
	Regulus .....	18,6	33,1	46,2	0,2	14,0	27,9	9.59.41,4		
	(a) Mars 1 L..... (Temp. 30°)	0,7	.....	28,0	.....	55,1	.....	11.36.22,3	+ 0,07	
	Mars 2 L.....	.....	16,4	.....	43,3	.....	10,4	11.36. ....	- 0,09	
	β Leonis.....	21,2	35,2	49,1	3,1	17,1	31,0	11.40.45,1		
	Polaris SP.....	35.11,8	43.31,5	51.54,6	0. 6,4	8.34,7	16,45,3	13.25.23,7		
	Jupiter 1 L.....	55,0	.....	22,0	.....	49,2	.....	13. 4.16,8	+ 0,07	
	Jupiter 2 L.....	.....	12,2	.....	39,1	.....	6,1	13. 4. ....	- 0,09	
	(b) ☽ 2 L.....	9,9	25,4	41,4	57,6	13,2	29,1	18.44.45,0		
Mar. 11	☉ 1 L.....	36,4	50,3	3,8	17,3	31,0	44,3	23.22.58,0		B.
	☉ 2 L.....	46,1	0,1	13,4	27,0	41,0	54,2	23.25. 8,0		
	Venus 1 L.....	12,8	26,4	39,8	53,6	7,1	20,5	0.38.34,1		
	Polaris.....	34.41,7	43.14,8	51.25,4	59.54,3	8.12,8	16.33,5	1.24.52,6		
	Castor .....	40,8	57,3	13,0	29,0	45,1	0,7	7.24.16,9		
	Procyon.....	21,1	34,8	48,2	2,0	15,1	28,9	7.30.42,2		
	Pollux..... (Temp. 30°)	50,9	7,0	21,8	37,2	52,6	7,9	7.35.23,1		
	(c) Mars 1 L.....	3,0	.....	30,1	.....	57,1	.....	11.33.24,3	+ 0,07	
	Mars 2 L.....	.....	17,9	.....	45,4	.....	12,7	11.33. ....	- 0,09	
	β Leonis.....	18,5	33,1	46,4	1,1	14,8	28,6	11.40.43,1		
	η Virginis.....	9,9	23,2	36,6	50,2	3,9	17,1	12.11.30,7		
	γ Virginis.....	57,1	11,1	24,8	38,2	51,9	6,2	12.25.19,1		
	Polaris SP.....	35. 7,7	43.28,5	51.48,3	0. 7,2	8.34,4	16.47,6	13.25.21,2		
	Jupiter 1 L.....	7,3	.....	34,1	.....	2,0	.....	13. 3.29,1	+ 0,07	
	Jupiter 2 L.....	.....	24,5	.....	51,4	.....	18,6	13. 3. ....	- 0,09	
Mar. 12	☉ 1 L.}	16,2	29,9	43,1	56,7	10,5	23,8	23.26.37,2		B.
	☉ 2 L.} ..... (hazy)	25,8	39,4	53,0	6,6	20,1	33,4	23.28.47,0		
	Castor.....	40,0	56,1	11,8	28,0	43,9	59,9	7.24.15,8		
	Procyon.....	19,9	34,1	47,2	1,1	14,8	27,6	7.30.41,3		
	Pollux .....	50,1	5,8	21,1	36,3	51,4	7,1	7.35.22,0		
Mar. 13	Regulus..... (Temp. 40°)	.....	28,3	41,6	56,0	9,6	23,3	9.59.37,4	- 6,95	B.
	(c) Mars 1 L.....	3,9	.....	30,8	.....	53,1	.....	11.30.25,6	+ 0,07	
	Mars 2 L.....	.....	18,7	.....	46,3	.....	13,1	11.30. ....	- 0,09	
	β Leonis.....	16,8	.....	45,2	58,9	12,9	26,8	11.40.41,0	- 4,64	
	(d) Jupiter 1 L.....	18,9	.....	45,6	.....	13,3	.....	13. 2.40,2	+ 0,07	
	Jupiter 2 L.....	.....	35,5	.....	3,1	.....	29,9	13. 2. ....	- 0,09	
Mar. 15	α Hydræ .....	5,8	19,5	32,8	46,8	0,4	13,9	9.19.27,0		B.
	Regulus.....	12,1	26,2	39,8	53,9	7,5	21,4	9.59.35,2		
Mar. 16	☉ 1 L.....	51,1	5,0	18,3	32,0	45,4	58,9	23.41.12,7		B.
	☉ 2 L.....	0,9	14,4	27,7	41,2	55,0	8,5	23.43.22,1		
	Castor.....	35,9	51,9	7,7	23,9	40,0	55,6	7.24.11,5		
	Procyon.....	16,1	29,8	42,9	57,0	10,3	23,8	7.30.37,3		
	Pollux.....	46,0	1,7	16,4	32,0	47,2	2,9	7.35.18,0		
Mar. 19	Procyon.....	12,7	26,4	39,8	53,8	7,3	20,7	7.30.34,1		B.
	Pollux .....	42,7	58,3	13,4	29,2	44,1	59,8	7.35.15,1		
	α Hydræ .....	1,1	15,0	28,2	42,2	56,1	9,7	9.19.23,1		
	Regulus.....	7,8	21,9	35,2	49,3	3,2	16,9	9.59.31,0		
	(c) Mars 1 L.....	9,1	.....	36,6	.....	4,0	.....	11.21.31,1	+ 0,07	
	Mars 2 L.....	.....	24,4	.....	51,7	.....	18,7	11.21. ....	- 0,09	
	β Leonis.....	10,7	25,1	38,3	52,9	6,7	20,8	11.40.34,7		

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, *ABCDEFGH*.  
The Transit levelled March 18, 2<sup>1</sup>/<sub>2</sub>h.

(a) Very unsteady. The diameter by the observation is too large.      (b) Very hazy and faint.      (c) Large diameter.  
(d) Very faint and cloudy.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>//</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
23.14.58,00	11,51	+ 4,80	3,68			1,25	46,94	23.16.51,84	☉'s center.
23.17.8,07			4,50	54,23	49,73		48,19	1.0.52,74	Polaris.
0.59.54,75			32,28	20,85	48,57			7.24.20,86	Castor.
7.23.31,58			5,03	53,67	48,64			7.30.53,61	Procyon.
7.30.4,37			40,73	29,08	48,35			7.35.29,32	Pollux.
7.34.40,04			53,61	42,29	48,68			9.19.42,28	α Hydræ.
9.18.52,97			0,86	49,56	48,70			9.59.49,57	Regulus.
9.59.0,20									
11.35.41,59			43,10					11.36.31,89	Mars' center.
11.35.43,28			3,77	52,73	48,96			11.40.52,57	β Leonis.
11.40.3,11	56,19		3,71	54,07	50,36			1.0.52,58	Polaris SP.
13.0.12,57									
13.3.35,82			38,07					13.4.26,94	Jupiter's center.
13.3.39,04			58,01					18.44.47,18	♃ 2 L.
18.43.57,37									
23.22.17,30	7,49	+ 4,06	22,82			1,05	49,81	23.24.13,65	☉'s center.
23.24.27,12			54,09				50,86	0.38.44,98	Venus 1 L.
0.37.53,47			1,56	53,51	51,95			1.0.52,46	Polaris.
0.59.50,73			29,66	20,82	51,16			7.24.20,84	Castor.
7.23.28,98			2,37	53,64	51,27			7.30.53,56	Procyon.
7.30.1,75			37,89	29,05	51,16			7.35.29,08	Pollux.
7.34.37,22									
11.32.43,69			45,09					11.33.36,45	Mars' center.
11.32.45,24			1,43	52,75	51,32			11.40.52,80	β Leonis.
11.40.0,80			50,83					12.11.42,22	η Virginis.
12.10.50,22	54,32		38,95					12.25.30,35	γ Virginis.
12.24.38,35			0,68	53,32	52,64			1.0.52,11	Polaris SP.
13.0.10,70			50,40					13.3.41,83	Jupiter's center.
13.2.48,19									
13.2.51,41									
23.25.56,77			2,22			0,95	50,91	23.27.54,06	☉'s center.
23.28.6,47			28,61	20,81	52,20		51,86	7.24.20,76	Castor.
7.23.27,93			1,47	53,63	52,16			7.30.53,63	Procyon.
7.30.0,85			36,93	29,04	52,11			7.35.29,09	Pollux.
7.34.36,26									
9.58.55,75			56,38	49,56	53,18	0,93	52,76	9.59.49,53	Regulus.
11.29.44,67			45,92					11.30.39,12	Mars' center.
11.29.45,94			59,59	52,77	53,18			11.40.52,80	β Leonis.
11.39.58,96			1,76					13.2.55,02	Jupiter's center.
13.1.59,57									
13.2.2,74									
9.18.46,60			47,17	42,25	55,08	1,14	54,70	9.19.42,31	α Hydræ.
9.58.53,73			54,31	49,55	55,24			9.59.49,48	Regulus.
23.40.31,91			37,22			1,20	54,74	23.42.33,14	☉'s center.
23.42.41,40			24,40	20,74	56,34		55,94	7.24.20,71	Castor.
7.23.23,79			57,31	53,57	56,26			7.30.53,62	Procyon.
7.29.56,74			32,63	28,98	56,35			7.35.28,95	Pollux.
7.34.32,03	53,15	+ 3,07	54,06	53,53	59,47	0,94	59,16	7.30.53,51	Procyon.
7.34.28,95			29,52	28,93	59,41			7.35.28,98	Pollux.
9.18.42,20			42,71	42,22	59,51			9.19.42,24	α Hydræ.
9.58.49,33			49,86	49,53	59,67			9.59.49,41	Regulus.
11.20.50,27			51,41					11.21.51,01	Mars' center.
11.20.51,51			53,28	52,80	59,52			11.40.52,89	β Leonis.
11.39.52,74									

Error of Collimation = + 3'',07.

Level Error = + 4'',50. From March 15 = + 3'',57.

Meridian Error from March 11 by Polaris and Polaris SP March 11, allowing + 0'',68 for loss of clock, and + 0'',19 for change of R.

Meridian Error from March 19 by β Leonis and Polaris SP March 19. No allowance for clock-rate.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Mar. 19	Jupiter 1 L.....	42,5	.....	9,9	.....	37,0	.....	13. 0. 4,1	+ 0,07	B.
	Jupiter 2 L.....	.....	59,7	.....	26,7	.....	53,9	12.59.....	- 0,09	B.
	Polaris SP.....	34.59,6	43.18,7	51.41,5	.....	8.24,4	16.35,7	13.25.11,5	- 0,57	B.
Mar. 20	Castor.....	31,9	48,1	3,8	19,7	35,8	51,6	7.24. 7,8		B.
	Procyon.....	1,7	25,9	39,2	52,6	6,2	19,8	7.30.33,1		B.
	Pollux..... (Temp. 42°)	41,6	57,4	12,2	28,1	43,1	58,5	7.35.14,1		B.
	(a) Jupiter 1 L.....	15,5	.....	42,1	.....	10,0	.....	12.59.36,9	+ 0,07	B.
	Jupiter 2 L.....	.....	32,6	.....	59,7	.....	26,5	12.59.....	- 0,09	B.
	(a) Spica.....	3,0	17,0	29,8	44,1	57,9	11,4	13.16.25,1		B.
Mar. 21	$\alpha$ Hydræ.....	59,2	13,1	26,2	40,3	54,1	7,8	9.19.21,1		B.
	(b) Jupiter 1 L.....	47,9	.....	15,1	.....	42,5	.....	12.58.....	+ 13,61	B.
	Jupiter 2 L.....	.....	5,5	.....	32,2	.....	59,1	12.58.....	- 0,09	B.
	Spica.....	.....	16,2	29,3	43,1	57,2	10,9	13.16.24,2	- 6,88	B.
Mar. 24	Castor.....	27,1	43,7	59,4	15,5	31,2	47,1	7.25. 3,2		B.
	Procyon.....	7,2	21,0	34,4	48,2	1,9	15,4	7.31.29,1		B.
	Pollux.....	37,1	53,1	8,1	23,7	39,1	54,0	7.36. 9,5		B.
	6 Cancri.....	47,2	3,1	17,9	33,4	48,9	4,0	7.54.19,4		B.
	$\theta$ Cancri.....	38,0	52,7	6,9	21,0	35,0	49,4	8.23. 3,8		B.
	$\eta$ 1 L.....	3,8	18,9	33,4	48,9	3,7	18,9	8.33.33,4		B.
	$\xi$ Cancri.....	18,0	32,8	47,1	2,1	16,8	31,3	9. 0.46,2		B.
	$\eta$ Cancri.....	12,9	27,7	41,1	55,7	10,1	24,1	9.10.38,4		B.
	(c) $\alpha$ Hydræ.....	56,3	10,2	23,2	37,0	50,4	4,2	9.20.17,7		B.
	Regulus.....	2,3	16,4	30,1	44,0	58,0	11,7	10. 0.25,5		B.
	$\odot$ 2 L.....	37,0	50,9	4,1	17,9	31,5	44,9	0.16.58,4		B.
	Venus 1 L.....	34,9	49,0	2,5	16,3	30,0	43,8	1.42.57,6		B.
	$\alpha$ Orionis.....	40,9	54,8	8,1	21,9	35,1	49,1	6.47. 2,8		B.
Mar. 25	Castor.....	26,1	42,7	58,1	14,3	30,1	46,2	7.25. 2,1		B.
	Procyon.....	5,5	20,2	33,3	47,2	0,9	14,2	7.31.27,9		B.
	Pollux.....	36,1	52,0	7,0	22,5	38,1	53,2	7.36. 8,5		B.
	(d) * (a) N.P.D. 68°. 2'...	21,1	36,1	50,0	4,8	19,3	34,1	8.48.48,8		B.
	$\xi$ Cancri.....	17,1	32,0	46,3	1,2	16,1	30,7	9. 0.45,1		B.
	$\eta$ Cancri.....	12,1	26,5	40,3	54,8	9,2	23,1	9.10.37,3		B.
	$\alpha$ Hydræ.....	54,9	9,0	21,7	36,1	50,0	3,2	9.20.16,8		B.
	$\eta$ 1 L.....	55,3	10,2	24,3	39,0	54,0	8,3	9.25.23,0		B.
	$\nu$ Leonis.....	47,1	1,5	14,9	29,1	42,8	57,1	9.50.10,6		B.
	$\eta$ Leonis.....	46,0	0,4	14,1	28,5	42,7	56,9	9.59.11,1		B.
	(e) $\odot$ 1 L.....	4,6	18,7	31,6	45,8	59,1	12,9	0.18.26,3		B.
	$\odot$ 2 L.....	14,0	28,0	40,8	54,9	8,4	22,1	0.20.35,4		B.
	Polaris..... (unsteady)	.....	43.54,6	52. 5,5	0.34,7	8.49,3	17.11,4	1.25.34,8	- 4.11,31	B.
	(f) Mercury 1 L.....	51,1	5,1	18,3	32,1	45,3	59,4	1. 6.13,2		B.
	Venus 1 L..... (unsteady)	10,1	24,1	37,4	51,7	5,3	19,2	1.47.33,0		B.
Mar. 26	Aldebaran.....	52,0	6,2	20,0	34,1	48,2	2,4	4.27.16,5		B.
	Procyon.....	5,1	19,3	32,1	46,3	59,8	13,1	7.31.27,0		B.
	Pollux.....	35,1	50,9	6,1	21,3	36,8	52,0	7.36. 7,2		B.
Mar. 27	$\rho$ Leonis.....	32,0	45,9	59,9	13,3	27,1	40,8	10.24.54,2		B.
	$\iota$ Leonis.....	59,4	13,6	27,1	41,0	54,8	8,5	10.41.22,1		B.
	$\eta$ 1 L..... (ragged)	24,0	38,1	51,3	5,7	19,3	33,1	10.58.47,2		B.
	Mars 1 L.....	13,9	.....	41,0	.....	8,7	.....	11.11.35,4	+ 0,07	B.
	Mars 2 L..... (very unsteady)	.....	28,7	.....	56,4	.....	23,6	11.11.....	- 0,09	B.
	$\nu$ Leonis.....	55,2	9,0	22,2	36,0	49,3	3,1	11.29.16,4		B.
	(g) $\beta$ Leonis..... (blazing)	2,2	16,7	30,1	44,2	58,3	12,3	11.41.26,1		B.
	$\kappa$ Draconis.....	24.28,4	25.10,5	25.50,1	26.31,5	27.12,3	27.53,0	12.28.33,7		B.
	(h) 42 Virginis.....	.....	.....	46,7	.....	14,2	.....	12.47.42,0	- 13,61	B.
	Jupiter 1 L.....	58,2	.....	25,4	.....	52,8	.....	12.57.20,0	+ 0,07	B.
	Jupiter 2 L.....	.....	15,6	.....	42,5	.....	9,8	12.57.....	- 0,09	B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, ABCDEFG.

March 23, 0<sup>h</sup>. The clock was put forward 1<sup>m</sup>.March 25, 3<sup>h</sup>. The Transit was levelled.

(a) Wind too loud. (b) Very cloudy. (c) Wire I was written down 55,3 and is altered conjecturally. (d) The stars designated by the letters (a), (b), (c), &c. were observed with Mars in 1837 with the five-feet Equatorial. (e) Very much motion. (f) Very unsteady. The observation as set down has been diminished 10". (g) The only clock star that could be observed. (h) Scarcely visible.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.	
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>		
12. 59. 23,44 12. 59. 26,68 13. 0. 1,33	46,72	+ 3,07	25,57 51,53	51,04	59,51	0,94	59,16	13. 0. 25,24 1. 0. 51,20	Jupiter's center. Polaris SP.	
7. 23. 19,82 7. 29. 52,64 7. 34. 27,86 12. 58. 56,19 12. 58. 59,51 13. 15. 44,04								7. 24. 20,76 7. 30. 53,52 7. 35. 28,79 12. 59. 58,93 13. 16. 45,12	Castor. Procyon. Pollux. Jupiter's center. Spica.	
9. 18. 40,25 12. 58. 28,78 12. 58. 32,18 13. 15. 43,27			40,76 30,99 43,77	42,21	61,45	0,89	60,98	9. 19. 42,09 12. 59. 32,45 13. 16. 45,24	$\alpha$ Hydræ. Jupiter's center. Spica.	
7. 24. 15,31 7. 30. 48,17 7. 35. 23,51 7. 53. 33,41 8. 22. 20,97 8. 32. 48,72 9. 0. 2,04 9. 9. 55,72 9. 19. 37,00 9. 59. 44,00		+ 4,29	15,98 48,78 24,16 34,06 21,61 49,36 2,67 56,35 37,60 44,62	20,60 53,46 28,85	4,62 4,68 4,69	1,07	4,32	7. 24. 20,63 7. 30. 53,44 7. 35. 28,82 7. 53. 38,73 8. 22. 26,30 8. 32. 54,06 9. 0. 7,39 9. 10. 1,08 9. 19. 42,34 9. 59. 49,39	Castor. Procyon. Pollux. 6 Cancri. $\theta$ Cancri. 1 L. $\xi$ Cancri. $\eta$ Cancri. $\alpha$ Hydræ. Regulus.	
0. 16. 17,82 1. 42. 16,30 6. 46. 21,81 7. 24. 14,23 7. 30. 47,03 7. 35. 22,48 8. 48. 4,89 9. 0. 1,21 9. 9. 54,76 9. 19. 35,96 9. 24. 39,16 9. 49. 29,02 9. 58. 28,53			18,43 16,92 22,43 14,90 47,64 23,13 5,53 1,84 55,39 36,56 39,79 29,64 29,16	28,12	5,69 5,69 5,80 5,71			1,06	5,37	0. 16. 23,81 1. 42. 22,37 6. 46. 28,10 7. 24. 20,60 7. 30. 53,34 7. 35. 28,84 8. 48. 11,29 9. 0. 7,61 9. 10. 1,17 9. 19. 42,34 9. 24. 45,58 9. 49. 35,44 9. 58. 34,97
0. 17. 45,57 0. 19. 54,80 1. 0. 30,41 1. 5. 32,07 1. 46. 51,54 4. 26. 34,20 7. 30. 46,10 7. 35. 21,34			46,57	50,80 40,30 32,68 52,15 34,83 46,71 21,99	49,87	9,57	1,07	6,46	0. 18. 57,27 1. 0. 46,80 1. 5. 39,19 1. 46. 58,69 4. 26. 41,49 7. 30. 53,51 7. 35. 28,79	$\odot$ 's center. Polaris. Mercury 1 L. Venus 1 L. Aldebaran. Procyon. Pollux.
10. 24. 13,31 10. 40. 40,92 10. 58. 5,53 11. 10. 54,82 11. 10. 56,14 11. 28. 35,89 11. 40. 44,27 12. 26. 31,36 12. 47. 0,69 12. 56. 39,17 12. 56. 42,54									13,93 41,53 6,15 56,10 36,50 44,90 32,51 1,31 41,47	52,83

Error of Collimation = + 3",07.

Level Error = + 3",57. From March 24 = + 4",20.

 Meridian Error from March 24 by Polaris March 26 and Polaris SP March 27, allowing + 1",59 for loss of clock and + 0",28 for change of  $\mathcal{R}$ .



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.		
Mar. 27	Polaris SP.....	35.44,7	44. 6,5	52.21,6	0.46,4	9.16,8	17.21,3	13.....	+ 4. 11,29	B.
	Pallas .....	20,9	35,0	48,4	2,8	16,4	30,1	13. 15. 44,0		B.
	Ceres .....	8,8	23,1	36,0	50,1	3,6	17,0	13. 32. 30,6		B.
Mar. 28	☉ 1 L.....	18,6	32,2	45,4	59,2	13,0	26,3	0. 25. 39,8		B.
	☉ 2 L.....	27,2	41,2	54,6	8,2	21,8	35,2	0. 27. 48,8		B.
Mar. 30	☉ 1 L.....	32,4	46,2	59,5	13,1	26,5	40,0	0. 32. 53,9	+ 0,01	G.
	☉ 2 L..... (very cloudy)	.....	.....	8,1	21,9	35,3	.....	0. 35.....		G.
Apr. 1	* (Z) N.P.D. 26°. 12'..	42.56,4	43.28,1	43.57,8	44.29,2	44.59,8	.....	10. 46. 0,7	+ 10,19	B.
	* N.P.D. 26°. 1'.....	50.41,7	51.13,1	51.42,8	52.14,0	52.44,3	53.14,9	10. 53. 45,8		B.
	Mars 1 L.....	24,3	38,3	51,7	5,7	19,2	33,0	11. 5. 46,4		B.
	(a) * N.P.D. 26°. 38'.....	15. 7,9	15.38,1	16. 7,4	16.38,1	17. 7,9	17.38,2	11. 18. 8,3		B.
	β Leonis.....	56,7	11,0	24,7	39,1	52,8	6,8	11. 41. 20,8		B.
	Polaris SP.....	35.42,7	.....	.....	0.45,3	9.11,4	17.22,6	13.....		B.
Apr. 5	(b) Jupiter 1 L.....	34,0	.....	1,1	.....	28,3	.....	12. 52. 55,2	+ 0,07	B.
	Jupiter 2 L.....	.....	50,9	.....	18,0	.....	44,9	12. 52.....	- 0,09	B.
	Spica .....	45,1	59,2	13,1	26,8	40,2	54,0	13. 17. 7,8		B.
	Arcturus.....	19,6	34,1	48,1	2,8	17,1	31,3	14. 8. 45,9		B.
Apr. 6	* (a) N.P.D. 68°. 2'...	7,5	22,6	36,7	51,5	5,9	20,4	8. 48. 35,0	- 7,24	C.
	(c) * (d) N.P.D. 68°. 21'..	28,6	43,3	57,7	12,6	27,0	41,8	8. 58. 56,2		C.
	(c) * (e) N.P.D. 68°. 40'..	30,4	45,0	59,4	14,0	28,5	42,8	9. 3. 57,3		C.
	* (g) N.P.D. 68°. 31'..	25,0	39,7	53,8	8,7	22,8	37,4	9. 9. 51,8		C.
	(d) * N.P.D. 68°. 57'.....	40,4	55,0	9,2	24,0	38,2	52,4	9. 15. 7,1		C.
	* (l) N.P.D. 70°. 1'.....	56,4	11,1	25,0	39,8	54,0	8,3	9. 20. 22,7		C.
	* (o) N.P.D. 69°. 17'..	.....	53,8	8,0	22,6	37,0	51,2	9. 23. 5,6		C.
	Regulus .....	47,7	2,0	15,3	29,3	43,1	57,2	10. 0. 11,1		B.
	(e) * N.P.D. 24°. 20' SP.	33.24,2	33.56,7	34.29,3	35. 1,8	35.35,1	36. 7,4	10. 36. 40,8		C.
	* N.P.D. 26°. 1'.....	50.35,2	51. 7,1	51.37,1	52. 8,0	52.38,8	53. 9,4	10. 53. 40,9		B.
	Mars 1 L.....	36,0	50,0	3,8	17,3	31,0	44,6	11. 0. 58,2		B.
	* N.P.D. 26°. 38'.....	15. 1,9	15.32,7	16. 2,4	16.33,1	17. 3,0	17.32,4	11. 18. 3,1		B.
	β Leonis.....	50,7	4,8	18,7	33,1	46,7	1,1	11. 41. 15,1		B.
	κ Draconis.....	24.17,6	24.59,1	25.39,0	26.20,6	27. 0,9	27.41,9	12. 28. 22,3		B.
	A.S.C. 91. SP.....	.....	41.42,0	44.28,7	47.15,8	.....	.....	.....	+ 2. 48,46	C.
	Jupiter 1 L.....	4,1	.....	31,3	.....	58,7	.....	12. 52. 25,4	+ 0,07	B.
	Jupiter 2 L.....	.....	21,3	.....	48,3	.....	15,2	12. 52.....	- 0,09	B.
	Pallas .....	49,1	3,7	17,3	31,6	45,8	59,9	13. 8. 13,7		B.
	* N.P.D. 33°. 32' SP.	16.16,0	16.40,0	17. 5,2	17.29,1	17.54,3	18.17,7	13. 18. 42,8		C.
	Ceres .....	40,1	54,1	7,4	21,1	34,9	48,3	13. 24. 2,1		B.
	☉ 2 L..... (very faint)	21,2	37,2	53,0	9,0	24,4	40,2	19. 20. 56,1		B.
Apr. 9	* N.P.D. 68°. 57'.....	37,1	51,4	6,1	20,2	35,1	49,4	9. 15. 4,0		B.
	α Hydræ.....	38,1	51,5	5,2	18,9	32,8	46,1	9. 20. 0,1		B.
Apr. 10	(f) ☉ 1 L.....	25,8	39,1	52,5	6,1	20,0	33,8	1. 12. 47,6	+ 4,52	B.
	☉ 2 L.....	35,1	49,0	2,2	16,0	29,9	.....	1. 14. 57,1		B.
	(g) Venus 1 L.....	34,9	49,0	3,1	17,2	31,6	45,5	2. 58. 0,2		B.
	Aldebaran.....	35,4	49,2	3,4	17,3	31,6	45,2	4. 26. 59,7		B.
	Rigel.....	43,5	57,1	11,2	24,3	38,2	51,6	5. 7. 5,9		B.
	β Tauri.....	57,4	13,0	27,9	43,4	59,1	14,0	5. 16. 29,7		B.
	Castor.....	8,8	24,4	40,1	56,2	12,3	28,1	7. 24. 44,6		B.
	Procyon.....	48,8	2,1	15,7	29,2	42,7	56,1	7. 31. 10,1		B.
	Pollux.....	18,4	33,9	49,0	4,3	20,0	35,1	7. 35. 50,6		B.
	* (a) N.P.D. 68°. 2'...	3,7	18,0	32,3	46,9	1,9	15,8	8. 48. 30,7		B.
	(h) * N.P.D. 25°. 2' SP.	0.37,1	1. 9,3	1.40,5	2.12,8	2.44,6	3.16,7	9. 3. 48,0	- 14,50	C.
	* (g) N.P.D. 68°. 31'..	.....	.....	50,0	4,1	18,9	33,1	9. 9. 47,9		B.
	* N.P.D. 68°. 57'.....	36,0	50,4	5,0	19,2	34,0	48,1	9. 15. 3,1		B.
	* (l) N.P.D. 70°. 1'...	52,0	6,9	21,1	35,2	50,0	4,1	9. 20. 18,6		B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, *ABCDEFGH*.From April 9..... WEST. .... *GFEDCBA*.The Transit levelled April 6, 4<sup>h</sup>.The Transit was reversed April 9, 4<sup>h</sup>, and levelled just before and after the reversion.

(a) This star was observed with the Circle in 1836, but the R.A. in p. 110 of the Volume for that year is erroneous. (b) Very cloudy.  
 (c) Not satisfactory: the stars were faint. (d) Disturbed and confused. Observed also on April 9, 10, and 19, but not the star intended to be taken: the N.P.D. is inferred from the setting and may be a few minutes wrong. (e) Satisfactory observation.  
 (f) Cloudy, and very great motion. (g) Exceedingly unsteady. (h) Very faint.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
13. 0. 47,51 13. 15. 2,51 13. 31. 49,88	31,70	+ 4,29	38,42 3,13 50,50	49,59	11,17	1,00	7,44	1. 0. 46,40 13. 15. 11,12 13. 31. 58,51	Polaris SP. Pallas. Ceres.
0. 24. 59,22 0. 27. 8,15			4,30				8,44	0. 26. 12,76	☉'s center.
0. 32. 13,08 0. 34. 21,78		+ 3,13	17,99			1,10	10,66	0. 33. 28,67	☉'s center.
10. 44. 28,86 10. 52. 13,80 11. 5. 5,51 11. 16. 37,99 11. 40. 38,85 13. 0. 46,90	39,30 31,09		29,85 14,80 6,08 38,96 39,43 35,99	52,84 49,39	13,41 13,40	1,13	12,86	10. 44. 43,21 10. 52. 28,17 11. 5. 19,46 11. 16. 52,35 11. 40. 52,84 1. 0. 49,46	*(Z)N.P.D.26°.12' * N.P.D. 26°.1' Mars 1 L. * N.P.D. 26°.38' β Leonis. Polaris SP.
12. 52. 14,72 12. 52. 17,84 13. 16. 26,60 14. 8. 2,70			16,79 27,11 3,24	45,30 21,53	18,19 18,29	1,31	17,49	12. 52. 34,98 13. 16. 45,32 14. 8. 21,50	Jupiter's center. Spica. Arcturus.
8. 47. 51,37 8. 58. 12,45 9. 3. 13,91 9. 9. 8,46 9. 14. 23,76 9. 19. 39,62 9. 22. 22,46 9. 59. 29,39 10. 35. 2,18 10. 52. 8,07 11. 0. 17,27 11. 16. 32,66 11. 40. 32,88 12. 26. 20,20 12. 47. 16,99 12. 51. 44,94 12. 51. 48,18 13. 7. 31,58 13. 17. 29,30 13. 23. 21,14 19. 20. 8,73			51,92 12,99 14,45 9,00 24,30 40,16 23,00 29,92 1,88 8,94 17,79 33,51 33,41 21,26 14,16 47,07 32,11 29,16 21,66 9,23	49,40 52,83	19,48 19,42	1,29	18,87	8. 48. 11,26 8. 58. 32,34 9. 3. 33,81 9. 9. 28,36 9. 14. 43,66 9. 19. 59,53 9. 22. 42,37 9. 59. 49,33 22. 35. 21,32 10. 52. 28,39 11. 0. 37,25 11. 16. 52,99 11. 40. 52,91 12. 26. 40,80 0. 47. 33,72 12. 52. 6,63 13. 7. 51,68 1. 17. 48,75 13. 23. 41,25 19. 20. 29,14	*(α)N.P.D.68°.2' *(d)N.P.D.68°.21' *(e)N.P.D.68°.40' *(g)N.P.D.68°.31' * N.P.D. 68°.57' *(l)N.P.D.70°.1' *(o)N.P.D.69°.17' Regulus. *N.P.D.24°.20'.SP. * N.P.D. 26°.1'. Mars 1 L. * N.P.D. 26°.38' β Leonis. κ Draconis. A.S.C. 91. SP. Jupiter's center. Pallas. *N.P.D.33°.32'.SP. Ceres. J 2 L.
9. 14. 20,47 9. 19. 18,96		+ 2,30	20,54 18,99	41,99	23,00	1,07	22,58	9. 14. 43,53 9. 19. 41,99	* N.P.D. 68°.57'. α Hydræ.
1. 12. 6,42 1. 14. 16,07 2. 57. 17,36 4. 26. 17,40 5. 6. 24,54 5. 15. 43,50 7. 23. 56,36 7. 30. 29,25 7. 35. 4,47 8. 47. 47,05 9. 2. 12,71 9. 9. 4,30 9. 14. 19,40 9. 19. 35,42			11,30 17,41 17,46 24,57 43,55 56,42 29,30 4,54 47,12 13,30 4,37 19,47 35,48	41,37 48,37 7,40 20,29 53,19 28,56	23,91 23,80 23,85 23,87 23,89 24,02	1,04	23,62	1. 13. 34,97 2. 57. 41,16 4. 26. 41,27 5. 6. 48,41 5. 16. 7,40 7. 24. 20,36 7. 30. 53,25 7. 35. 28,49 8. 48. 11,12 21. 2. 37,31 9. 9. 28,39 9. 14. 43,49 9. 19. 59,50	☉'s center. Venus 1 L. Aldebaran. Rigel. β Tauri. Castor. Procyon. Pollux. *(α)N.P.D.68°.2' *N.P.D.25°.2'.SP. *(g)N.P.D.68°.31' * N.P.D. 68°.57'. *(l) N.P.D.70°.1'

Error of Collimation = +3",07. From April 9 = -3",22.

Level Error = +4",20. From April 5 = +3",33. From April 9 = +3",38, the mean of two levellings.

Meridian Error from March 30 by β Leonis and Polaris SP April 1, no allowance being made for clock-rate.

..... from April 9 by Polaris April 10 and Polaris SP April 11, allowing +0",59 for loss of clock and -0",03 for change of R.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Apr. 10	* (o) N.P.D. 69°. 17'..	.....	49,2	3,8	18,0	32,6	47,0	9.23. 1,8	- 7,21	B.
	Polaris.....	.....	.....	.....	0.26,8	8.53,2	.....	1.25.35,7	- 11.9,26	B.
Apr. 11	☉ 1 L.....	4,2	17,6	31,3	45,1	58,8	12,4	1.16.26,3		B.
	☉ 2 L.....	14,1	27,8	41,3	55,0	9,0	22,2	1.18.36,3		B.
	Venus 1 L.....	24,1	38,3	52,3	6,9	21,1	34,9	3.2.49,4		B.
	Aldebaran.....	34,3	.....	2,3	16,2	30,7	44,2	4.26.58,8	- 4,68	B.
	Rigel.....	42,3	56,0	9,8	23,2	37,1	50,5	5.7.4,4		B.
	β Tauri.....	56,3	12,0	27,0	41,9	58,0	12,7	5.16.28,4		B.
	Castor.....	.....	.....	39,1	55,0	11,1	26,8	7.24.43,1	- 15,96	B.
	Procyon.....	.....	.....	.....	.....	42,0	55,1	7.31.9,0	- 27,16	B.
	(a) Mars 1 L.....	57,3	11,1	24,4	38,3	52,1	5,9	10.57.19,8		B.
	β Leonis.....	45,6	0,2	14,1	27,4	41,9	55,3	11.41.9,8		B.
	κ Draconis.....	24.13,1	24.53,4	25.34,2	26.15,1	26.56,3	27.36,1	12.28.17,9		B.
	Jupiter 1 L.} (cloudy)	37,8	.....	5,0	.....	32,0	.....	12.49.59,2	- 0,07	B.
	Jupiter 2 L.}	.....	54,9	.....	21,7	.....	49,0	12.49.....	+ 0,09	B.
	Polaris SP.....	35.9,8	43.43,5	51.57,7	.....	.....	.....	12.....	+ 16.41,69	B.
Apr. 15	(b) Polaris.....	.....	43.44,2	52.3,3	.....	8.47,5	16.57,7	1.25.24,4	- 5.0,75	B.
Apr. 16	☉ 1 L.....	22,7	35,9	50,1	4,1	18,0	31,4	1.34.45,3		B.
	☉ 2 L.....	33,0	46,8	0,3	14,1	28,0	41,5	1.36.55,4		B.
	(c) * (Z) N.P.D. 26°. 12'..	42.39,8	43.10,3	43.40,7	.....	.....	45.11,9	10.45.43,3	+ 6,13	B.
	Mars 1 L. .... (cloudy)	30,4	44,0	57,6	11,7	25,3	38,8	10.54.52,9		B.
	Polaris..... (very cloudy)	.....	43.42,6	.....	.....	8.49,8	16.57,3	1.....	- 2.46,00	B.
Apr. 17	(d) ☉ 2 L.....	13,9	27,5	41,3	54,9	9,0	22,4	1.40.....	+ 6,90	B.
	(e) Venus 1 L. .... (unsteady)	40,7	55,1	9,8	23,9	38,5	52,8	3.32.7,3		B.
	(e) Aldebaran.....	.....	.....	.....	9,1	23,2	37,0	4.26.51,3	- 21,07	B.
	(e) ☉ 1 L.....	1,7	17,3	33,1	48,8	4,8	20,4	5.5.36,2		B.
	Jupiter 1 L.....	46,4	.....	13,9	.....	40,8	.....	12.47.7,9	- 0,07	B.
	Jupiter 2 L.....	.....	3,3	.....	30,1	.....	57,0	12.46.....	+ 0,09	B.
	Pallas.....	41,1	55,7	10,1	24,0	38,6	52,1	13.0.7,1		B.
	Polaris SP.....	35.9,3	43.41,7	51.49,2	.....	8.35,8	.....	13.25.16,5	+ 3.20,70	B.
	Ceres.....	56,0	9,8	23,1	36,7	50,8	4,2	13.14.18,1		B.
	Spica.....	32,0	45,4	59,2	13,1	26,8	40,4	13.16.54,0		B.
	ο Virginis.....	47,3	1,0	14,7	28,1	41,9	55,1	13.35.8,8		B.
	Arcturus.....	6,1	20,1	34,8	49,1	3,9	17,9	14.8.32,1		B.
	ι Bootis.....	17,1	30,9	44,7	58,8	12,8	26,2	14.11.40,1		B.
Apr. 18	☉ 2 L..... (cloudy)	54,9	8,9	22,5	.....	.....	.....	1.44.18,2	+ 10,30	B.
	(f) Venus 1 L.....	37,6	52,1	6,5	20,7	35,2	49,4	3.37.4,0		B.
Apr. 19	☉ 1 L.....	25,9	39,9	53,2	7,3	21,5	35,0	1.45.48,6		B.
	☉ 2 L.....	36,6	50,5	4,3	18,0	31,9	45,5	1.47.59,3		B.
	Venus 1 L.....	34,6	49,2	4,0	18,0	32,6	47,0	3.42.1,9		B.
	Aldebaran.....	24,7	38,7	52,7	6,8	20,8	34,5	4.26.49,1		B.
	Rigel.....	32,7	46,1	59,9	13,5	27,2	40,8	5.6.54,7		B.
	β Tauri.....	46,8	2,1	17,4	32,6	48,1	3,2	5.16.19,0		B.
	ε Geminorum.....	42,7	57,3	12,1	27,0	.....	.....	6.34.12,3	+ 8,95	B.
	(g) ☉ 1 L.....	11,3	26,0	41,3	57,1	13,0	28,1	7.15.44,0		B.
	Castor.....	57,7	13,4	29,2	45,2	1,7	17,0	7.24.33,2		B.
	Procyon.....	37,7	51,0	4,9	18,3	32,1	45,2	7.30.59,0		B.
	Pollux.....	7,7	22,9	38,1	53,5	9,0	24,0	7.35.39,7		B.
	* (h) N.P.D. 68°. 47'..	14,0	28,2	42,9	57,1	12,1	26,2	9.10.40,9		B.
	* N.P.D. 68°. 57'..	25,0	39,4	53,9	8,4	23,1	37,1	9.14.51,8		B.
	* (k) N.P.D. 70°. 15'..	15,1	29,5	44,1	58,5	13,1	27,1	9.17.41,7		B.
	α Hydræ.....	.....	.....	53,4	7,2	20,8	34,2	9.19.48,1	- 13,61	B.
	(h) * (o) N.P.D. 69°. 17'..	24,1	38,5	52,9	7,0	21,8	.....	9.22.50,7	+ 4,78	B.
	Regulus.....	33,1	46,7	0,8	14,2	28,1	42,1	9.59.56,0		B.
	* (Z) N.P.D. 26°. 12'..	35,9	6,7	37,1	7,2	38,8	8,6	10.45.39,5		B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.  
The Transit levelled April 16, 2<sup>h</sup>.

- (a) Very unsteady.  
(b) Quite a blur and very unsteady.  
(c) Faint.  
(d) Very cloudy and unsteady.

- (e) Loud wind.  
(f) Cloudy and faint.  
(g) Wire I should perhaps be 10,3.  
(h) Cloudy.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>''</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
9.22.18,19 1. 0.29,31	27,89	+2,30	18,26 24,53	49,84	25,31	1,04 1,07	23,62 24,68	9.22.42,29 1. 0.49,25	*( <i>o</i> ) N.P.D. 69°. 17'. Polaris.
1.15.45,10 1.17.55,10 3. 2. 6,72 4.26.16,40 5. 6.23,33 5.15.42,33 7.23.55,06 7.30.28,21 10.56.38,42 11.40.27,76 12.26.15,16 12.49.18,43 12.49.21,96 13. 0.18,69			50,15 6,78 16,46 23,36 42,39 55,12 28,26 38,48 27,83 15,01					1.17.14,89 3. 2.31,59 4.26.41,34 5. 6.48,27 5.16. 7,31 7.24.20,13 7.30.53,28 10.57. 3,65 11.40.53,03 12.26.40,25	☉'s center. Venus 1 L. Aldebaran. Rigel. β Tauri. Castor. Procyon. Mars 1 L. β Leonis. κ Draconis.
	20,38		19,98 23,98	52,82 49,87	24,99 25,89			12.49.45,23 1. 0.49,24	Jupiter's center. Polaris SP.
1. 0.22,67		+1,10	18,70	50,84	32,14	1,22	30,65	1. 0.49,40	Polaris.
1.34. 3,93 1.36.14,16 10.44.11,33 10.54.11,53 1. 0.23,90	21,54		9,03 11,24 11,51 19,93					1.35.39,76 10.44.42,43 10.54.42,71 1. 0.51,85	☉'s center. *(Z) N.P.D. 26°. 12'. Mars 1 L. Polaris.
1.39.55,07 3.31.24,01 4.26. 9,08 5. 4.48,90 12.46.27,18 12.46.30,22 12.59.24,10 13. 0.15,20 13.13.36,96 13.16.12,98 13.34.28,13 14. 7.49,15 14.10.58,66	17,79		55,05 23,99 9,07 48,89 28,65 24,08 19,51 36,93 12,92 28,10 49,13 58,65	41,31	32,24			1.40.27,00 3.31.56,04 4.26.41,16 5. 5.21,02 12.47. 1,17 12.59.56,61 1. 0.52,04 13.14. 9,47 13.16.45,46 13.35. 0,66 14. 8.21,72 14.11.31,24	☉ 2 L. Venus 1 L. Aldebaran. J 1 L. Jupiter's center. Pallas. Polaris SP. Ceres. Spica. α Virginis. Arcturus. ι Bootis.
1.43.36,42 3.36.20,78			36,40 20,76				33,09	1.44. 9,58 3.36.54,03	☉ 2 L. Venus 1 L.
1.45. 7,34 1.47.18,02 3.41.18,19 4.26. 6,76 5. 6.13,56 5.15.32,74 6.33.27,23 7.14.57,26 7.23.45,34 7.30.18,32 7.34.53,55 9. 9.57,35 9.14. 8,39 9.16.58,45 9.19. 7,13 9.22. 7,28 9.59.14,43 10.44. 7,69		+2,24	12,71 18,21 6,79 13,57 32,77 27,26 57,29 45,37 18,34 53,58 57,38 8,42 58,47 7,14 7,31 14,46 7,56	41,30 48,27 7,29 20,13 53,05 28,40 41,87 49,27	34,51 34,70 34,52 34,76 34,71 34,82 34,73 34,81	1,24	34,30	1.46.47,10 3.41.52,70 4.26.41,32 5. 6.48,13 5.16. 7,34 6.34. 1,90 7.15.31,96 7.24.20,05 7.30.53,03 7.35.28,27 9.10.32,15 9.14.43,20 9.17.33,25 9.19.41,92 9.22.42,09 9.59.49,28 10.44.42,42	☉'s center. Venus 1 L. Aldebaran. Rigel. β Tauri. ε Geminorum. J 1 L. Castor. Procyon. Pollux. *(h) N.P.D. 68°. 47'. * N.P.D. 68°. 57'. *(k) N.P.D. 70°. 15'. α Hydræ. *(o) N.P.D. 69°. 17'. Regulus. *(Z) N.P.D. 26°. 12'.

Error of Collimation = -3'',22.

Level Error = +3'',38. From April 15 = +2'',91.

Meridian Error from April 15 by Polaris April 16 and Polaris SP April 17, allowing +0°,58 for loss of clock and -0°,15 for change of  $\mathcal{R}$ .Meridian Error from April 19 by Polaris SP and Polaris April 19, allowing +0°,63 for loss of clock and -0°,10, for change of  $\mathcal{R}$ .



## TRANSITS OBSERVED IN THE YEAR 1839.

Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Apr. 19	* N.P.D. 26°. 38'.....	46,8	17,0	47,1	17,0	47,2	17,1	11. 17. 47,8		B.
	β Leonis.....	36,1	49,9	4,1	17,8	32,1	45,8	11. 41. 0,1		B.
	κ Draconis.....	24. 3,5	24.43,8	25.24,5	26. 5,4	26.47,2	27.26,6	12. 28. 8,2		B.
	Jupiter 1 L.....	51,1	....	18,0	....	45,1	....	12. 46. 12,2	- 0,07	B.
	Jupiter 2 L.....	....	7,8	....	34,7	....	2,0	12. 46. ....	+ 0,09	B.
	Polaris SP.....	35. 5,3	43.37,2	51.45,2	0.14,3	8.32,2	16.52,0	13. 25. 12,2		B.
	Arcturus.....	3,8	18,1	32,2	46,4	1,2	15,1	14. 8. 29,8		B.
	ι Bootis.....	14,7	28,1	42,0	56,1	10,0	23,7	14. 11. 38,0		B.
	(a) Polaris.....	35.21,3	43.43,5	....	....	....	....	0. ....	+ 20. 50,01	B.
Apr. 20	(b) ☉ 1 L.....	7,7	21,7	35,3	49,1	3,3	16,8	1. 49. 30,9		B.
	☉ 2 L.....	18,4	32,1	46,0	59,8	14,0	27,7	1. 51. 41,4		B.
	(b) Venus 1 L.....	33,2	47,9	2,0	16,5	31,5	45,4	3. 47. 0,2		B.
	☾ 1 L... (cloudy and unsteady)	7,1	22,1	37,0	52,2	7,6	22,4	8. 14. 38,0		B.
	(c) Jupiter 1 L.....	24,1	....	51,1	....	18,0	....	12. 45. 45,0	- 0,07	B.
	Jupiter 2 L.....	....	40,7	....	8,0	....	34,5	12. 45. ....	+ 0,09	B.
	(a) Pallas.....	....	....	8,8	23,1	37,7	52,3	12. 58. 6,0	- 14,32	B.
	Ceres.....	23,1	36,8	50,1	3,7	17,2	30,8	13. 11. 44,6		B.
	Spica.....	28,1	41,6	55,2	9,3	23,1	36,3	13. 16. 50,5		B.
	Arcturus.....	2,3	16,6	31,0	45,2	0,1	14,2	14. 8. 28,4		B.
	ι Bootis.....	13,0	26,7	40,9	54,8	9,1	22,6	14. 11. 36,7		B.
Apr. 21	δ Cancri.....	13,1	26,9	41,4	55,5	10,1	24,1	8. 35. 38,4		B.
	ξ Cancri.....	45,8	0,5	15,1	29,7	44,3	58,7	9. 0. 13,6		B.
	☾ 1 L.....	1,8	16,4	30,9	45,4	59,8	14,7	9. 8. 29,0		B.
	α Hydræ.....	23,7	37,2	50,8	4,2	18,3	31,2	9. 19. 45,4		B.
	λ Leonis.....	11,7	26,3	40,9	55,9	11,0	25,1	9. 22. 40,0		B.
	(d) Regulus.....	30,4	43,9	58,0	11,4	25,3	39,4	9. 59. 53,2		B.
Apr. 22	☉ 1 L.....	32,7	46,4	0,2	14,3	28,2	41,8	1. 56. 55,9		B.
	☉ 2 L.....	43,8	57,2	11,1	25,0	39,0	52,3	1. 59. 6,8		B.
	Venus 1 L.....	33,0	47,3	2,0	16,7	31,2	45,5	3. 57. 0,1		B.
	ξ Cancri.....	44,9	59,2	13,7	28,2	43,1	57,7	9. 0. 12,7		B.
	α Hydræ.....	22,3	36,0	49,6	3,1	17,1	30,3	9. 19. 44,1		B.
	λ Leonis.....	10,2	25,1	39,8	54,3	9,3	23,8	9. 22. 38,8		B.
	ψ Leonis.....	39,0	52,4	6,8	20,8	34,8	48,2	9. 35. 2,5		B.
	☾ 1 L.....	30,3	44,3	58,8	13,1	27,8	41,3	9. 57. 56,0		B.
	(e) Regulus.....	....	....	56,9	10,9	24,9	38,1	9. 59. 52,2	- 13,84	B.
	β Leonis.....	32,1	46,1	59,9	14,0	28,1	42,1	11. 40. 56,0		B.
	(a) Polaris.....	....	43.37,3	51.57,2	....	....	....	1. 25. 21,7	- 1,85	B.
Apr. 24	(a) ☉ 1 L.....	....	....	....	41,0	54,9	9,0	2. 4. 22,9	- 20,82	B.
	☉ 2 L.....	11,0	24,4	38,1	52,0	6,3	19,8	2. 6. 34,0		B.
	(a) Aldebaran.....	19,0	32,7	46,8	0,6	....	....	4. 26. 42,9	+ 8,42	B.
	Rigel.....	26,9	40,3	54,1	7,7	21,5	34,9	5. 6. 48,8		B.
	Castor.....	51,4	7,4	23,3	39,2	55,4	11,0	7. 24. 27,2		B.
	Procyon.....	31,6	45,1	58,7	12,0	26,0	39,1	7. 30. 53,0		B.
	Pollux.....	1,7	17,0	32,2	47,6	3,0	18,1	7. 35. 33,8		B.
	α Hydræ.....	20,1	33,9	47,3	1,0	14,8	28,1	9. 19. 41,8		B.
	(f) Regulus.....	26,7	40,9	54,5	8,3	22,7	36,1	9. 59. 50,1		B.
	(a) χ Leonis.....	23,0	....	49,9	3,9	17,2	....	10. 56. 45,1	- 0,04	B.
	(a) τ Leonis.....	20,1	....	47,1	0,7	14,3	....	11. 19. ....	+ 10,13	B.
	☾ 1 L..... (ragged)	33,0	46,7	0,4	14,2	28,3	42,0	11. 27. 56,0		B.
	(a) Polaris.....	....	43.35,8	51.56,3	....	8.43,5	16.49,7	1. ....	+ 0,60	B.
Apr. 25	(g) ☉ 2 L..... (cloudy)	54,7	8,5	22,4	36,4	50,6	4,0	2. 10. 18,2		B.
	(g) Venus 1 L.....	40,0	54,7	9,0	23,9	38,5	52,7	4. 12. 8,0		B.
	Rigel.....	25,8	39,1	52,8	6,5	20,4	33,8	5. 6. 47,8		B.
	β Tauri.....	39,7	54,9	10,2	25,4	41,2	56,1	5. 16. 11,8		B.
	Castor.....	50,6	6,7	22,3	38,2	54,3	9,9	7. 24. 26,2		B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.  
The Transit levelled April 23, 1<sup>h</sup>.

(a) Cloudy.

(b) Much motion, and wind too loud.

(c) Cloudy and faint.

(d) Cloudy and faint: wires IV, V, and VII very doubtful.

(e) Hurried.

(f) The observation has been increased 30° for error in counting.

(g) Great motion.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>''</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
11. 16. 17,14 11. 40. 17,99 12. 26. 5,60 12. 45. 31,53 12. 45. 34,92 13. 0. 11,20 14. 7. 46,66 14. 10. 56,09 1. 0. 22,41	13,79       20,05	+ 2,24	17,02 18,02 5,37 33,23 17,30 46,67 56,13 16,78	52,79    51,79 21,68  51,89	34,77    34,49 35,01  35,11	1,24       1,31	34,30       35,51	11. 16. 51,90 11. 40. 52,92 12. 26. 40,31 12. 46. 8,19 1. 0. 52,27 14. 8. 21,70 14. 11. 31,16 1. 0. 52,34	* N.P.D. 26°. 38'. β Leonis. κ Draconis. Jupiter's center. Polaris SP. Arcturus. ι Bootis. Polaris.
1. 48. 49,26 1. 50. 59,92 3. 46. 16,67 8. 13. 52,34 12. 45. 4,48 12. 45. 7,82 12. 57. 23,26 13. 11. 3,76 13. 16. 9,16 14. 7. 45,40 14. 10. 54,83			54,62 16,70 52,37 6,16 23,28 3,79 9,16 45,42 54,87	       45,40 21,69	       36,24 36,27			1. 50. 30,23 3. 46. 52,42 8. 14. 28,33 12. 45. 42,37 12. 57. 59,49 13. 11. 40,02 13. 16. 45,39 14. 8. 21,70 14. 11. 31,15	☉'s center. Venus 1 L. Jupiter's center. Pallas. Ceres. Spica. Arcturus. ι Bootis.
8. 34. 55,64 8. 59. 29,68 9. 7. 45,43 9. 19. 4,40 9. 21. 55,85 9. 59. 11,65			55,66 29,69 45,45 4,40 55,86 11,67	   41,84  49,25	   37,44  37,58	1,28	36,99	8. 35. 33,11 9. 0. 7,16 9. 8. 22,93 9. 19. 41,89 9. 22. 33,35 9. 59. 49,19	δ Cancrī. ξ Cancrī. Jupiter's center. α Hydræ. λ Leonis. Regulus.
1. 56. 14,21 1. 58. 25,03 3. 56. 16,55 8. 59. 28,50 9. 19. 3,21 9. 21. 54,47 9. 34. 20,64 9. 57. 13,08 9. 59. 10,76 11. 40. 14,04			19,64 16,56 28,51 3,21 54,48 20,66 13,10 10,78 14,06	   41,83   49,24 52,77	   38,62   38,46 38,71	1,06	38,14	1. 57. 57,87 3. 56. 54,87 9. 0. 7,05 9. 19. 41,76 9. 22. 33,03 9. 34. 59,22 9. 57. 51,68 9. 59. 49,36 11. 40. 52,71	☉'s center. Venus 1 L. ξ Cancrī. α Hydræ. λ Leonis. ψ Leonis. Jupiter's center. Regulus. β Leonis.
1. 0. 16,88  2. 3. 41,13 2. 5. 52,23 4. 26. 0,82 5. 6. 7,75 7. 23. 39,28 7. 30. 12,21 7. 34. 47,63 9. 19. 1,00 9. 59. 8,48 10. 56. 3,78 11. 19. 0,68 11. 27. 14,37 1. 0. 16,92	            14,06	+ 2,97	9,68  46,73 0,86 7,80 39,30 12,26 47,67 1,05 8,53 3,83 0,74 14,42 9,72	52,70   41,27 48,23 20,05 52,98 28,32 41,80 49,21  52,96	43,02   40,41 40,43 40,75 40,72 40,65 40,75 40,68   43,24	1,06            1,07	40,31            41,36	1. 0. 50,03  2. 5. 27,13 4. 26. 41,37 5. 6. 48,34 7. 24. 19,94 7. 30. 52,90 7. 35. 28,31 9. 19. 41,77 9. 59. 49,28 10. 56. 44,62 11. 19. 41,55 11. 27. 55,24 1. 0. 51,12	Polaris.  ☉'s center. Aldebaran. Rigel. Castor. Procyon. Pollux. α Hydræ. Regulus. χ Leonis. τ Leonis. Jupiter's center. Polaris.
2. 9. 36,40 4. 11. 23,83 5. 6. 6,60 5. 15. 25,62 7. 23. 38,32			36,45 23,88 6,65 25,65 38,35	  48,22 7,24 20,04	  41,57 41,59 41,69			2. 10. 17,91 4. 12. 5,43 5. 6. 48,24 5. 16. 7,25 7. 24. 20,04	☉ 2 L. Venus 1 L. Rigel. β Tauri. Castor.

Error of Collimation = -3",22,

Level Error = +2",91. From April 21 = +2",66.

Meridian Error from April 23 by Polaris April 24 and Polaris SP April 25, allowing +0",56 for loss of clock, and -0",31 for change of  $\mathcal{R}$ .



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Apr. 25	Procyon.....	30,8	44,1	57,7	11,1	25,0	38,1	7.30.51,7		B.
	Pollux.....	0,7	15,9	31,0	46,3	2,0	17,0	7.35.32,7		B.
	α Hydræ.....	19,0	32,7	46,1	59,8	13,8	27,1	9.19.40,9		B.
	Regulus.....	26,0	40,0	53,4	7,2	21,2	35,1	9.59.49,1		B.
	(a) * (Z) N.P.D. 26°. 12'..	42.29,1	42.59,1	43.29,9	44. 0,2	44.31,1	45. 1,6	10.45.32,8		B.
	Mars 1 L..... (hazy)	10,3	24,0	37,8	51,2	5,3	19,0	10.53.32,4		B.
	χ Leonis.....	21,8	35,2	49,0	2,6	16,4	30,0	10.56.43,6		B.
	τ Leonis.....	19,2	32,4	46,0	59,4	13,0	26,4	11.19.40,1		B.
	β Virginis.....	58,2	12,1	25,2	38,7	52,2	5,8	11.42.19,4		B.
	ο Virginis.....	39,9	53,2	7,1	20,9	34,5	48,1	11.57. 2,0		B.
	η 1 L..... (ragged)	30,1	43,8	57,4	11,1	25,1	38,4	12.10.52,3		B.
	γ <sup>1</sup> Virginis.....	10,1	23,5	37,2	50,7	4,1	17,8	12.33.31,1		B.
	Jupiter 1 L.....	13,0	.....	40,0	.....	7,1	.....	12.43.34,0	- 0,07	B.
	Jupiter 2 L.....	.....	29,8	.....	56,6	.....	23,4	12.43.....	+ 0,09	B.
	Pallas..... (faint)	36,2	50,7	5,1	19,2	34,1	48,2	12.55. 2,9		B.
	(b) Polaris SP.....	34.55,3	.....	51.39,6	0. 6,7	.....	.....	13.24.56,8	+ 2.6,67	B.
	Ceres.....	21,1	34,5	48,1	1,8	15,4	28,9	13. 7.43,0		B.
	Spica.....	22,3	36,1	49,5	3,4	17,2	30,9	13.16.44,8		B.
	ο Virginis.....	38,1	51,4	5,1	18,9	32,3	45,8	13.34.59,6		B.
Apr. 26	(c) Venus 1 L.....	43,9	58,7	13,4	.....	.....	57,2	4.17.12,3	+ 2,94	B.
	Castor.....	49,4	5,5	21,2	37,1	53,2	9,0	7.24.25,2		B.
	Procyon.....	29,4	42,9	56,9	10,0	24,0	36,9	7.30.51,0		B.
	Pollux.....	59,3	14,8	30,0	45,3	1,0	15,9	7.35.31,4		B.
	Regulus.....	24,9	38,8	52,3	6,1	20,0	33,8	9.59.48,1		B.
Apr. 27	Mars 1 L.....	23,1	37,0	50,9	4,2	18,0	31,4	10.53.45,5		B.
	η 1 L.....	48,0	2,2	16,1	30,4	44,9	58,9	13.38.13,2		B.
	λ Virginis.....	1,1	14,8	28,9	42,2	56,5	10,0	14.10.24,1		B.
	ε Bootis.....	29,9	45,2	0,3	15,5	31,1	46,0	14.38. 1,4		B.
	α <sup>2</sup> Libræ.....	35,0	49,0	3,2	17,1	31,1	44,8	14.41.59,1		B.
Apr. 28	λ Virginis.....	59,9	14,1	27,4	41,1	55,3	8,9	14.10.22,9		B.
	(d) η 1 L.....	7,9	22,1	36,9	51,3	6,3	21,1	14.24.36,0		B.
	η 2 L.....	17,0	31,1	46,0	0,4	15,3	29,3	14.26.44,4		B.
	ε Bootis.....	29,0	44,1	58,9	14,3	30,1	44,9	14.38. 0,2		B.
	α <sup>2</sup> Libræ.....	33,9	48,1	2,1	15,8	30,0	43,9	14.41.58,1		B.
	20 Libræ.....	12,2	27,1	42,1	56,8	12,0	26,2	14.54.41,0		B.
	Polaris..... (great motion)	.....	43.32,7	51.57,6	0.10,5	8.36,3	16.49,8	1.25.17,4	- 4.9,89	B.
Apr. 29	☉ 1 L.}..... (hazy)	44,0	57,9	12,0	26,0	40,3	54,2	2.23. 8,1		B.
	☉ 2 L.}.....	56,1	10,2	24,0	38,0	52,1	5,9	2.25.20,1		B.
	Venus 1 L..... (faint)	1,4	16,0	30,6	45,3	0,4	14,9	4.32.30,0		B.
	α Hydræ.....	14,8	28,1	41,7	55,2	9,0	22,4	9.19.36,1		B.
	Regulus.....	21,1	35,1	48,9	2,8	16,9	30,2	9.59.44,1		B.
	Mars 1 L.....	46,4	0,1	14,0	27,3	41,1	54,5	10.54. 9,0		B.
	Jupiter 1 L.}.... (cloudy)	35,0	.....	2,0	.....	29,0	.....	12.41.56,0	- 0,07	B.
	Jupiter 2 L.}....	.....	51,5	.....	18,7	.....	45,2	12.41.....	+ 0,09	B.
	Pallas..... (cloudy)	.....	43,0	57,1	11,8	26,9	40,8	12.52.55,1	- 7,23	B.
	Ceres.....	22,9	36,4	49,9	4,2	17,9	31,2	13. 4.44,9		B.
	Spica..... (cloudy)	17,7	31,9	45,2	58,8	.....	26,1	13.16.....	+ 11,02	B.
	Arcturus.....	52,1	6,3	20,9	34,9	49,7	3,9	14. 8.18,2		B.
	ε Bootis.....	27,8	42,8	58,1	13,2	28,7	43,5	14.37.59,1		B.
	α <sup>2</sup> Libræ.....	32,9	46,9	0,9	14,7	29,1	42,5	14.41.57,2		B.
	20 Libræ.....	10,8	26,1	40,8	55,5	11,0	25,1	14.54.39,9		B.
	η 2 L..... (very cloudy)	32,2	46,4	1,9	17,3	32,3	47,1	15.16. 2,6		B.
	χ Libræ..... (cloudy)	.....	.....	.....	2,8	17,4	31,9	15.30.46,8	- 22,04	B.
	δ Scorpil.....	21,7	36,1	50,8	5,1	20,0	34,2	15.50.49,1		B.
	Polaris..... (very faint)	35.15,4	43.36,2	51.56,7	0. 8,5	8.38,8	16.46,6	1.....	+ 4.10,85	B.
Apr. 30	☉ 1 L.}..... (cloudy & faint)	30,8	44,9	58,6	12,9	26,7	40,4	2.26.54,8		B.
	☉ 2 L.}.....	.....	.....	11,0	25,0	38,9	52,6	2.29. 7,0	- 13,98	B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.  
The Transit levelled April 30, 1<sup>h</sup>.

- (a) Disturbed.

(b) The seconds of wire III were written down 59,6 evidently by mistake. They are altered conjecturally.
- (c) Cloudy and very great motion.

(d) Correction applied to apparent *AR* of 1 L for defect of illumination = - 0<sup>s</sup>.03.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
7.30.11,21 7.34.46,52 9.18.59,92 9.59.7,43 10.44.0,54 10.52.51,43 10.56.2,66 11.18.59,50 11.41.38,80 11.56.20,81 12.10.11,17 12.32.50,64 12.42.53,45 12.42.56,69 12.54.19,49 13.0.1,27 13.7.1,83 13.16.3,46 13.34.18,75	4,33	+ 2,97	11,26 46,55 59,97 7,48 0,35 51,48 2,71 59,55 38,85 20,86 11,21 50,69 55,11 19,53 8,98 1,88 3,50 18,80	52,97 28,31 41,79 49,20	41,71 41,76 41,82 41,72	1,07	41,36	7.30.52,95 7.35.28,25 9.19.41,74 9.59.49,29 10.44.42,19 10.53.33,32 10.56.44,56 11.19.41,41 11.42.20,73 11.57.2,75 12.10.53,11 12.33.32,61 12.43.37,04 12.55.1,46 1.0.50,92 13.7.43,83 13.16.45,45 13.35.0,76	Procyon. Pollux. $\alpha$ Hydræ. Regulus. *(Z) <sub>N.P.D.</sub> 26°.12'. Mars 1 L. $\chi$ Leonis. $\tau$ Leonis. $\beta$ Virginis. $\sigma$ Virginis. J 1 L. $\gamma$ Virginis. Jupiter's center. Pallas. Polaris SP. Ceres. Spica. $\sigma$ Virginis.
4.16.28,04 7.23.37,23 7.30.10,15 7.34.45,39 9.59.6,29			28,09 37,26 10,20 45,42 6,34	20,02 52,95 28,29 49,19	42,76 42,75 42,87 42,85			4.17.10,72 7.24.20,04 7.30.52,98 7.35.28,21 9.59.49,24	Venus 1 L. Castor. Procyon. Pollux. Regulus.
10.53.4,30 13.37.30,52 14.9.42,51 14.37.15,63 14.41.17,04			4,28 30,47 42,46 15,62 16,98	59,95 1,37	44,33 44,39			10.53.48,45 13.38.14,78 14.10.26,80 14.37.59,98 14.42.1,34	Mars 1 L. J 1 L. $\lambda$ Virginis. $\epsilon$ Bootis. $\alpha^2$ Libræ.
14.9.41,37 14.23.51,65 14.26.0,50 14.37.14,50 14.41.15,99 14.53.56,77 1.0.14,16			41,32 51,58 0,43 14,49 15,93 56,67 9,31	59,96 1,38 54,50	45,47 45,45 45,19			14.10.26,76 14.24.37,00 14.26.45,88 14.37.59,95 14.42.1,39 14.54.42,14 1.0.55,29	$\lambda$ Virginis. J 1 L. J 2 L. $\epsilon$ Bootis. $\alpha^2$ Libræ. 20 Libræ. Polaris.
2.22.26,07 2.24.38,06 4.31.45,52 9.18.55,33 9.59.2,73 10.53.27,49 12.41.15,43 12.41.18,56 12.52.11,89 13.4.3,91 13.15.58,96 14.7.35,14 14.37.13,31 14.41.14,89 14.53.55,60 15.15.17,12 15.30.2,66 15.50.5,29 1.0.14,55			32,06 45,50 55,28 2,71 27,47 16,97 11,88 3,89 58,92 35,12 13,30 14,83 55,50 17,03 2,58 5,21 9,70	41,74 49,15 45,43 21,76 59,97 1,40 54,99	46,46 46,44 46,51 46,64 46,67 46,57 45,29			2.24.18,11 4.32.31,65 9.19.41,66 9.59.49,13 10.54.13,93 12.42.3,52 12.52.58,44 13.4.50,46 13.16.45,50 14.8.21,74 14.37.59,94 14.42.1,48 14.54.42,16 15.16.3,70 15.30.49,26 15.50.51,91 1.0.56,81	☉'s center. Venus 1 L. $\alpha$ Hydræ. Regulus. Mars 1 L. Jupiter's center. Pallas. Ceres. Spica. Arcturus. $\epsilon$ Bootis. $\alpha^2$ Libræ. 20 Libræ. J 2 L. $\chi$ Libræ. $\delta$ Scorpii. Polaris.
2.26.12,73 2.28.24,92			18,82					2.28.6,00	☉'s center.
2.26.12,73 2.28.24,92	11,79					1,18	47,06		

Error of Collimation = -3",22.

Level Error = +2",66. From April 27 = +2",71.

Meridian Error from April 27 by Polaris, Polaris SP, and Polaris April 29 and 30.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.		
Apr. 30	Regulus .....	20,0	33,9	47,9	1,6	15,5	29,2	9.59.43,1		B.
	Mars 1 L..... (hazy)	2,1	15,7	29,3	43,0	56,8	10,1	10.54.24,1		B.
	$\beta$ Leonis.....	23,1	37,0	50,9	5,2	19,1	33,0	11.40.47,1		B.
	Jupiter 1 L.....	11,4	.....	38,3	.....	5,4	.....	12.41.32,2	- 0,07	B.
	Jupiter 2 L.....	.....	28,1	.....	54,8	.....	22,0	12.41.....	+ 0,09	B.
	(a) Pallas.....	59,2	14,1	28,0	42,6	57,0	11,7	12.52.26,2		B.
	Polaris SP.....	34.56,4	43.27,2	.....	0.7,3	8.23,7	.....	13.25.2,5	+ 1.39,06	B.
	(a) Ceres.....	41,0	54,5	7,9	21,2	35,0	48,6	13.4.2,7		B.
	Spica.....	16,9	30,3	43,9	57,8	11,7	25,1	13.16.39,2		B.
	(a) $\alpha$ Virginis.....	32,3	46,0	59,3	13,0	26,8	40,1	13.34.54,0		B.
	Arcturus.....	51,0	5,3	19,8	33,9	48,4	2,6	14.8.17,0		B.
	(a) 10 Hydræ Con.....	12,1	27,0	41,7	56,3	12,1	26,1	14.36.41,3		B.
	$\alpha^s$ Libræ.....	31,6	45,7	59,6	13,9	27,8	41,4	14.41.55,7		B.
	(a) $\theta$ Ursæ Minoris.....	.....	33.30,2	34.34,5	35.38,3	36.44,1	37.47,0	15.38.52,2	- 32,12	B.
May 1	$\delta$ Scorpii.....	20,1	35,0	49,7	4,0	18,8	33,0	15.50.48,1		B.
	Polaris..... (cloudy)	.....	43.30,8	51.51,3	0.7,5	.....	.....	1.25.14,7	- 0,54	B.
	$\odot$ 1 L.....	17,7	31,7	45,6	59,4	14,0	27,7	2.30.41,8		B.
	$\odot$ 2 L.....	29,8	44,0	58,0	11,9	26,4	39,9	2.32.54,0		B.
	(a) Venus 1 L.....	16,9	31,3	46,0	1,0	15,7	30,0	4.42.45,0		B.
	Spica.....	15,5	29,1	42,9	56,4	10,2	23,9	13.16.38,1		B.
	78 Virginis } ... (very faint)	31,2	45,1	58,7	12,0	25,9	39,1	13.25.52,9		B.
	$\alpha$ Virginis }	31,1	44,9	58,4	12,0	25,4	39,0	13.34.52,7		B.
	Arcturus.....	49,8	4,1	18,4	33,0	47,2	1,4	14.8.16,0		B.
	$\alpha^s$ Libræ.....	30,4	44,1	58,2	12,1	26,1	40,3	14.41.....	+ 7,02	B.
	$\odot$ 1 L. } ..... (great motion)	5,8	19,2	33,1	47,3	1,4	15,1	2.34.29,4		B.
	$\odot$ 2 L. }	17,9	31,4	45,8	59,3	13,8	27,5	2.36.41,9		B.
	(b) $\beta$ Leonis.....	21,0	34,9	49,0	3,0	17,2	30,9	11.40.45,3		B.
	Polaris.....	35.11,6	.....	.....	.....	.....	16.42,7	1.25.13,3	- 5.32,89	B.
May 2	$\odot$ 1 L.....	53,4	7,7	21,0	35,4	49,9	3,8	2.38.17,8		B.
	$\odot$ 2 L.....	6,0	19,9	34,2	48,0	2,4	16,1	2.40.30,3		B.
	Venus 1 L.....	34,3	49,0	3,9	18,7	33,9	48,3	4.53.3,4		B.
	Castor.....	41,0	56,8	13,0	28,6	45,0	0,6	7.24.16,9		B.
	Procyon.....	21,0	34,7	48,1	1,9	15,7	28,8	7.30.42,5		B.
	Pollux.....	51,1	6,5	21,6	37,0	52,8	7,9	7.35.23,2		B.
	$\alpha$ Hydræ.....	10,1	23,6	36,9	50,5	4,7	17,6	9.19.31,4		B.
	Regulus.....	16,4	30,1	44,1	58,0	11,9	25,7	9.59.39,3		B.
	Mars 1 L.....	3,1	16,7	30,2	44,0	58,0	11,2	10.55.25,0		B.
	$\beta$ Leonis.....	19,7	33,4	47,8	1,4	15,9	29,1	11.40.43,7		B.
	Jupiter 1 L.....	3,9	.....	30,8	.....	58,1	.....	12.40.24,9	- 0,07	B.
	Jupiter 2 L.....	.....	20,5	.....	47,4	.....	14,3	12.40.....	+ 0,09	B.
	Pallas.....	39,7	54,1	8,9	23,2	37,8	52,1	12.51.7,0		B.
	Polaris SP.....	34.51,8	43.20,2	.....	0.5,4	8.21,3	.....	13.24.58,5	+ 1.39,05	B.
May 3	(c) Ceres.....	41,1	55,0	8,7	22,1	36,0	49,2	13.2.3,0		B.
	(d) Spica.....	13,1	26,7	40,4	54,5	8,3	21,3	13.16.35,3		B.
	Arcturus.....	47,4	2,2	16,0	30,4	45,1	59,1	14.8.13,6		B.
	10 Hydræ Con.....	9,0	23,2	38,1	53,0	8,1	22,7	14.36.37,8		B.
	$\alpha^s$ Libræ.....	28,1	42,1	56,0	10,1	24,0	37,8	14.41.52,0		B.
	(e) * N.P.D. 97°. 16'.....	7,9	21,1	35,1	48,3	2,3	15,7	15.8.29,6		B.
	(f) * N.P.D. 106°. 53'.....	57,9	11,2	26,1	40,1	54,0	8,1	15.20.22,5		B.
	(g) $\theta$ Ursæ Minoris.....	.....	.....	34.31,5	35.35,2	36.40,6	37.43,6	15.38.49,5	- 1.4,27	B.
	$\theta$ Draconis.....	46,2	12,7	38,4	4,8	31,1	56,7	15.59.23,8		B.
	48 Serpentis.....	40,0	53,9	8,3	22,1	36,7	50,6	16.4.4,9		B.
	Antares.....	59,1	14,1	28,7	44,1	59,1	13,6	16.19.29,2		B.
	$\eta$ Herculis.....	10,8	24,2	37,8	51,4	5,1	17,9	16.24.32,1		B.
	Saturn 1 L.....	3,8	.....	31,9	.....	1,0	.....	16.29.29,7	- 0,07	B.
	Saturn 2 L.....	.....	21,3	.....	49,6	.....	18,4	16.29.....	+ 0,09	B.
May 4	$\odot$ 1 L.....	42,1	55,9	10,2	23,8	38,4	52,2	2.42.6,3		B.
	$\odot$ 2 L.....	54,7	8,8	22,7	36,9	51,1	5,0	2.44.19,2		B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, *GFEDCBA*.  
The Transit levelled May 7, 2<sup>h</sup>.

(a) Hazy and faint. (b) Grouped with the clock stars of May 3. (c) Hurried. (d) Confused. The first four wires have each been diminished 10". (e) This is the star observed with the Circle in 1836. Its R.A. in p. 111 of the Volume for that year is incorrect. (f) The star observed with the transit in 1837, whose N.P.D. is put down 107° in p. (130) of the Volume for that year. (g) Hurried at first.





Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
May 4	(a) Venus 1 L.....	44,1	59,0	13,9	28,9	43,8	58,2	4. 58. 13,4		B.
	(b) Rigel..... (unsteady)	15,1	28,8	42,1	55,9	9,9	22,8	5. 6. 37,1		B.
May 5	Polaris.....	35. 7,7	43.27,5	51.48,4	0. 3,8	8.30,7	16.41,5	1. 25. 11,6		B.
May 6	☉ 1 L.....	20,8	34,8	49,1	3,0	17,2	31,2	2. 49. 45,6		B.
	☉ 2 L.....	33,9	48,1	2,2	16,2	30,9	44,3	2. 51. 58,9		B.
	Aldebaran.....	4,9	18,9	32,9	46,8	1,1	14,9	4. 26. 29,1		B.
	α Serpentis.....	47,4	1,1	14,7	28,2	41,9	55,1	15. 36. 9,1		B.
	δ Ophiuchi.....	22,0	35,7	49,2	2,4	16,2	29,3	16. 5. 42,9		B.
	(c) Antares.....	.....	.....	25,7	41,1	56,2	10,5	16. 19. 25,8	- 15,01	B.
	Saturn 1 L.....	12,0	.....	40,7	.....	9,8	.....	16. 28. 38,0	- 0,07	B.
	Saturn 2 L.....	.....	29,6	.....	57,9	.....	26,6	16. 28. ....	+ 0,09	B.
	☽ 2 L..... (cloudy)	51,4	5,9	20,3	34,9	49,0	3,4	21. 49. 18,0		B.
	Polaris..... (blur)	35. 9,2	43.29,7	51.49,6	0. 5,8	8.32,5	16.40,8	1. 25. 12,3		B.
May 7	☉ 1 L.....	11,8	25,8	39,5	54,0	8,2	22,0	2. 53. 36,2		B.
	☉ 2 L.....	25,0	38,9	53,0	7,3	21,3	35,2	2. 55. 49,8		B.
	Aldebaran.....	4,1	17,8	31,9	45,8	0,1	13,7	4. 26. 28,2		B.
	Venus 1 L.....	16,9	31,6	46,7	1,2	16,7	31,1	5. 13. 46,2		B.
	β Tauri.....	.....	.....	56,2	11,7	27,1	42,1	5. 15. 57,7	- 15,34	B.
	Castor.....	36,1	52,4	8,3	24,1	40,1	55,8	7. 24. 12,0		B.
	Procyon.....	16,7	30,1	43,7	56,8	11,1	24,2	7. 30. 37,8		B.
	Pollux.....	46,6	1,8	17,1	32,1	47,8	2,8	7. 35. 18,5		B.
	Regulus.....	12,0	25,7	39,4	53,3	7,3	20,9	9. 59. 35,0		B.
	Mars 1 L.....	57,6	11,7	25,0	38,8	52,9	6,1	10. 57. 20,0		B.
	β Leonis.....	15,1	28,9	43,2	56,8	11,1	24,9	11. 40. 39,0		B.
	Jupiter 1 L.....	40,2	.....	7,2	.....	34,9	.....	12. 39. 1,9	- 0,07	B.
	Jupiter 2 L.....	.....	57,1	.....	24,0	.....	51,0	12. 38. ....	+ 0,09	B.
	Pallas.....	11,7	26,1	40,4	55,1	10,0	24,1	12. 49. 39,0		B.
	Ceres.....	18,7	32,1	46,2	59,4	13,1	26,3	12. 59. 40,1		B.
	(d) Polaris SP.....	34.44,5	43.24,2	.....	.....	8.10,7	.....	13. 24. 50,4	+ 2. 4,64	B.
	Spica..... (flaming)	8,8	22,0	36,1	49,4	3,7	17,2	13. 16. 30,9		B.
	Arcturus.....	43,0	57,0	11,6	25,9	40,7	54,3	14. 8. 9,2		B.
	10 Hydræ Con.....	4,1	18,7	33,8	48,3	3,9	18,0	14. 36. 33,1		B.
	α <sup>2</sup> Libræ.....	23,7	38,1	51,3	5,4	19,9	33,3	14. 41. 47,8		B.
	Polaris.....	35. 7,2	43.29,5	51.46,7	0. 3,8	8.33,2	16.38,5	1. 25. 11,6		B.
May 8	(e) ☉ 1 L.....	2,7	16,7	31,2	45,0	59,3	13,3	2. 57. 27,6		B.
	☉ 2 L.....	16,1	30,3	44,2	58,4	12,8	26,6	2. 59. 41,0		B.
	Aldebaran.....	3,1	16,8	31,0	45,0	59,0	12,9	4. 26. 27,1		B.
	Rigel.....	10,9	24,3	38,1	51,7	5,7	18,9	5. 6. 32,9		B.
	Castor.....	35,0	51,3	7,2	23,1	39,2	54,8	7. 24. 11,3		B.
	Procyon.....	15,8	29,1	42,7	56,1	9,8	23,0	7. 30. 36,9		B.
	Pollux.....	45,4	0,8	16,0	31,2	46,9	1,8	7. 35. 17,4		B.
	Regulus.....	11,0	24,8	38,5	52,1	6,2	19,8	9. 59. 33,9		B.
	Mars 1 L..... (cloudy)	32,4	46,0	59,5	13,1	27,0	40,4	10. 57. 54,2		B.
	β Leonis.....	14,1	28,2	42,2	55,9	10,1	23,8	11. 40. 37,9		B.
	Polaris SP.....	34.49,7	43.20,4	51.28,8	.....	.....	.....	12. ....	+ 16. 40,38	B.
May 10	Mars 1 L.....	48,0	1,7	15,1	28,6	42,7	56,0	10. 59. 10,0		B.
	β Leonis..... (cloudy)	.....	26,0	40,1	.....	8,4	22,2	11. 40. 36,1	- 8,42	B.
	Polaris SP.....	34.47,6	43.18,5	.....	.....	.....	16.27,8	13. 24. 51,3	- 0,17	B.
	Arcturus..... (blazing)	39,9	54,1	8,7	23,4	37,2	51,3	14. 8. 6,2		B.
	δ Ophiuchi.....	.....	.....	45,0	58,3	11,9	25,2	16. 5. 39,0	- 13,51	B.
May 11	Mars 1 L..... (unsteady)	28,8	42,3	56,0	9,4	23,3	36,9	10. 59. 51,0		B.
	β Leonis.....	10,9	24,9	38,8	53,0	7,1	20,8	11. 40. 34,9		B.
	Antares.....	50,7	5,3	20,3	35,4	51,3	5,5	16. 19. 20,9		B.
May 12	Polaris.....	.....	43.27,7	51.49,5	0. 4,2	8.33,6	16.39,8	1. 25. 9,3	- 4. 9,75	B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.  
The Transit levelled May 15, 0<sup>h</sup><sub>2</sub>.

(a) Cloudy and very unsteady.

(b) The clock error by this star is unsatisfactory.

(c) Blazing between clouds.

(d) Ill-defined and dancing.

(e) Excessive motion.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>''</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
4. 57. 28,76 5. 5. 55,96		+ 1,64	28,72 55,90	48,17	52,27	1,22	52,01	4. 58. 20,98 5. 6. 48,17	Venus 1 L. Rigel.
1. 0. 7,31		+ 2,47	59,94	57,63	57,69	1,18	53,99	1. 0. 53,98	Polaris.
2. 49. 3,10 2. 51. 16,36		}	9,73					2. 51. 3,86	☉'s center.
4. 25. 46,94			46,94	41,26	54,32			4. 26. 41,15	Aldebaran.
15. 35. 28,22			28,22	23,02	54,80			15. 36. 22,98	α Serpentis.
16. 5. 2,53			2,54	57,20	54,66			16. 5. 57,32	δ Ophiuchi.
16. 18. 40,85			40,82	35,57	54,75			16. 19. 35,61	Antares.
16. 27. 55,05 16. 27. 58,12		}	56,58					16. 28. 51,38	Saturn's center.
21. 48. 34,70			34,69			1,17	54,04	21. 49. 29,79	♃ 2 L.
1. 0. 8,56	4,80		1,19	57,99	56,80		55,21	1. 0. 56,45	Polaris.
2. 52. 53,93 2. 55. 7,22		}	0,58					2. 54. 55,93	☉'s center.
4. 25. 45,94			45,94	41,26	55,32			4. 26. 41,37	Aldebaran.
5. 13. 1,48			1,47					5. 13. 56,93	Venus 1 L.
5. 15. 11,62			11,61	7,18	55,57			5. 16. 7,08	β Tauri.
7. 23. 24,11			24,09	19,87	55,78			7. 24. 19,66	Castor.
7. 29. 57,20			57,20	52,82	55,62			7. 30. 52,78	Procyon.
7. 34. 32,38			32,36	28,15	55,79			7. 35. 27,94	Pollux.
9. 58. 53,37			53,38	49,06	55,68			9. 59. 49,08	Regulus.
10. 56. 38,88			38,89					10. 57. 34,63	Mars 1 L.
11. 39. 57,00			57,00	52,67	55,67			11. 40. 52,78	β Leonis.
12. 38. 20,98 12. 38. 24,12		}	22,55					12. 39. 18,37	Jupiter's center.
12. 48. 55,20			55,20					12. 49. 51,03	Pallas.
12. 58. 59,42			59,43					12. 59. 55,27	Ceres.
12. 59. 52,09	56,01		59,88	58,20	58,32			1. 0. 55,72	Polaris SP.
13. 15. 49,73			49,73	45,45	55,72			13. 16. 45,58	Spica.
14. 7. 25,96			25,95	21,79	55,84			14. 8. 21,85	Arcturus.
14. 35. 48,56			48,54					14. 36. 44,46	10 Hydræ Con.
14. 41. 5,64			5,64	1,47	55,83			14. 42. 1,57	α <sup>2</sup> Libræ.
1. 0. 7,21	3,45		59,84	58,39	58,55	0,98	56,28	1. 0. 56,16	Polaris.
2. 56. 45,11 2. 58. 58,49		}	51,80					2. 58. 48,20	☉'s center.
4. 25. 44,99			44,99	41,26	56,27			4. 26. 41,45	Aldebaran.
5. 5. 51,78			51,78	48,15	56,37			5. 6. 48,27	Rigel.
7. 23. 23,13			23,11	19,86	56,75			7. 24. 19,69	Castor.
7. 29. 56,20			56,20	52,81	56,61			7. 30. 52,79	Procyon.
7. 34. 31,35			31,33	28,14	56,81			7. 35. 27,92	Pollux.
9. 58. 52,33			52,34	49,05	56,71			9. 59. 49,03	Regulus.
10. 57. 13,23			13,24					10. 58. 9,97	Mars 1 L.
11. 39. 56,03			56,03	52,66	56,63			11. 40. 52,79	β Leonis.
12. 59. 53,35	57,27		1,14	58,59	57,45			1. 0. 57,95	Polaris SP.
10. 58. 28,88 11. 39. 54,14		}	28,90			1,09	58,10	10. 59. 27,50	Mars 1 L.
12. 59. 51,13			54,15	52,65	58,50			11. 40. 52,78	β Leonis.
14. 7. 22,97	55,05		59,29	59,56	60,27			1. 0. 57,98	Polaris SP.
16. 4. 58,37			22,97	21,80	58,83			14. 8. 21,71	Arcturus.
			58,39	57,26	58,87			16. 5. 57,22	δ Ophiuchi.
10. 59. 9,68 11. 39. 52,91			9,70			1,13	59,23	11. 0. 9,45	Mars 1 L.
16. 18. 35,63			52,92	52,64	59,72			11. 40. 52,70	β Leonis.
			35,62	35,67	60,05			16. 19. 35,62	Antares.
1. 0. 7,60	2,21		58,25	1,11	62,86	1,22	61,00	1. 0. 59,30	Polaris.

Error of Collimation = - 3'',22.

Level Error = + 2'',21. From May 12 = + 1'',39.

The two sets of three consecutive Transits of Polaris May 6, 7, and 8, give for Meridian Error + 2'',68 and + 2'',25.

The mean is adopted from May 5.

Meridian Error from May 10 by Polaris SP May 10 and Polaris May 12, allowing + 2'',60 for loss of clock, and - 1'',55 for change of  $\mathcal{R}$ .



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
May 14	☉ 1 L.....	21,9	35,9	50,3	4,5	19,0	32,7	3. 20. 47,4		B. B. B. B. B. B. B. B. B.
	☉ 2 L.....	36,1	50,4	4,8	19,1	33,4	47,0	3. 23. 2,0		
	Venus 1 L... (very cloudy)	.....	.....	14,0	28,9	44,0	58,9	5. 50. 14,0	- 14,96	
	ε Bootis .....	11,8	27,1	42,0	57,4	12,6	27,3	14. 37. 43,0		
	α <sup>2</sup> Libræ .....	16,8	30,9	44,7	58,4	13,0	26,7	14. 41. 40,8		
	Antares .....	47,7	2,6	17,8	32,7	48,0	2,5	16. 19. 18,1		
	Saturn 1 L.} (cloudy)	47,8	.....	16,4	.....	45,1	.....	16. 25. ....	+ 14,28	
	Saturn 2 L.}	.....	4,9	.....	33,7	.....	2,3	16. 26. ....	+ 0,09	
	α Herculis .....	36,0	50,0	3,6	17,7	31,7	45,2	17. 6. 59,7		
May 15	☉ 1 L.} (hazy)	17,0	31,3	45,4	59,7	14,3	28,2	3. 24. 42,9		B. B. B. B. B. B. B. B. B.
	☉ 2 L.}	31,4	45,9	0,1	14,2	28,9	43,0	3. 26. 57,4		
	(a) δ Ophiuchi.....	12,9	26,2	39,7	53,2	6,9	20,2	16. 6. 33,9		
	(a) Antares .....	46,2	1,3	16,2	31,3	46,2	1,3	16. 20. 16,5		
	Saturn 1 L.....	28,8	.....	57,2	.....	26,0	.....	16. 26. 54,4	- 0,07	
	Saturn 2 L.....	.....	46,2	.....	14,8	.....	42,3	16. 26. ....	+ 0,09	
	α Herculis.....	34,8	48,7	2,7	16,6	30,9	44,4	17. 7. 58,2		
	Polaris.....	36. 8,7	44. 28,4	52. 46,3	1. 4,6	9. 27,2	17. 40,8	1. 26. 12,5		
May 16	☉ 1 L.....	12,9	27,0	41,1	55,3	10,1	24,1	3. 29. 38,7		B. B. B. B. B. B. B. B. B.
	☉ 2 L.....	27,4	41,9	55,9	10,3	24,7	38,9	3. 31. 53,2		
	Rigel..... (cloudy)	2,5	.....	29,8	43,1	56,9	10,3	5. 7. ....	+ 2,75	
	β Tauri.....	16,2	31,7	46,9	2,3	17,9	33,0	5. 16. 48,7		
	(a) δ Ophiuchi.....	11,8	25,2	38,4	52,1	6,1	19,2	16. 6. 32,9		
	(a) Antares.....	45,1	0,3	15,0	30,1	45,2	0,1	16. 20. 15,4		
	Saturn 1 L.....	9,7	.....	38,0	.....	7,1	.....	16. 26. 35,5	- 0,07	
	Saturn 2 L.....	.....	27,3	.....	55,8	.....	24,6	16. 26. ....	+ 0,09	
	α Herculis.....	33,9	48,0	1,8	15,7	29,8	43,1	17. 7. 57,4		
May 17	Polaris.....	36. 7,5	44. 28,7	52. 47,2	1. 3,4	9. 34,6	17. 35,8	1. 26. 7,3		B. B. B. B. B. B. B. B. B.
	(b) ☉ 1 L.....	8,9	22,9	37,1	51,5	6,2	20,3	3. 33. 34,6		
	☉ 2 L.....	23,9	38,0	52,2	6,6	21,0	35,1	3. 35. 49,7		
	(b) Venus 1 L.....	21,6	36,3	51,3	6,2	21,2	36,0	6. 6. 51,4		
	☉ 1 L.....	18,3	33,5	48,8	4,1	19,7	34,9	7. 50. 50,3		
	δ Cancri..... (cloudy)	.....	.....	11,9	26,3	40,7	55,0	8. 36. 9,2	- 14,25	
	Regulus.....	1,2	15,1	28,8	42,3	56,3	9,7	10. 0. 24,0		
	Mars 1 L.....	16,0	29,5	43,1	56,8	10,8	24,1	11. 5. 37,9		
	β Leonis.....	4,3	18,1	32,1	46,0	0,3	14,0	11. 41. 28,1		
May 17	(c) Jupiter 1 L.....	51,1	.....	18,9	.....	45,8	.....	12. 37. 13,9	- 0,07	B. B. B. B. B. B. B. B. B.
	Jupiter 2 L.....	.....	8,8	.....	35,5	.....	2,9	12. 37. ....	+ 0,09	
	Pallas .....	8,1	22,7	37,1	51,8	6,7	20,9	12. 48. 36,1		
	(d) Ceres .....	.....	.....	22,4	36,3	50,0	3,2	12. 56. 17,0	- 13,61	
	(e) Polaris SP.....	.....	44. 17,3	52. 27,3	0. 53,7	9. 10,5	17. 27,3	13. 25. 48,6	- 4. 10,67	
	10 Hydræ Con.....	53,1	8,1	22,9	37,8	53,1	7,3	14. 37. 22,8		
	α <sup>2</sup> Libræ.....	12,9	26,8	41,1	54,9	9,1	22,9	14. 42. 37,0		
	* N.P.D. 97°. 16'.....	52,8	6,3	19,9	33,4	47,1	0,7	15. 9. 14,4		
	* N.P.D. 106°. 53'.....	42,9	56,9	11,0	25,0	39,0	53,1	15. 21. 7,4		
May 17	τ <sup>2</sup> Serpentis .....	18,1	32,1	46,3	0,7	14,9	28,9	15. 29. 43,1		B. B. B. B. B. B. B. B. B.
	θ Draconis .....	57. 31,1	57. 57,2	58. 23,8	58. 49,9	59. 16,8	59. 42,0	16. 0. 8,7		
	δ Ophiuchi .....	10,4	24,2	37,3	50,8	4,9	18,0	16. 6. 32,0		
	Antares .....	44,1	59,2	14,1	29,2	44,1	59,0	16. 20. 14,2		
	Saturn 1 L.....	50,3	.....	19,0	.....	48,0	.....	16. 26. 17,0	- 0,07	
	Saturn 2 L.....	.....	8,1	.....	36,6	.....	5,3	16. 26. ....	+ 0,09	
	ι Herculis.....	21,1	35,1	48,9	2,1	16,0	29,2	16. 38. 43,1		
	ι Ophiuchi.....	38,3	51,9	6,0	19,2	33,1	46,8	16. 47. 0,9		
	* N.P.D. 76°. 10'.....	29,8	43,8	57,3	11,1	25,0	39,0	16. 56. 53,0		
May 18	α Herculis.....	32,6	46,1	0,1	14,1	28,0	42,1	17. 7. 56,0		B. B. B. B. B. B. B. B. B.
	Polaris.....	36. 6,4	44. 25,7	52. 44,5	1. 3,2	9. 25,7	17. 39,8	1. 26. 8,7		
	(f) Mercury 2 L.....	.....	.....	49,9	3,4	17,3	30,9	2. 9. 44,7	- 13,70	
	☉ 1 L.....	5,7	19,8	34,0	48,3	3,2	16,9	3. 37. 32,0		
	☉ 2 L.....	20,2	34,7	49,1	3,4	18,0	32,1	3. 39. 46,9		

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, *GFEDCBA*.  
After the observation of the Sun, May 15, the clock was put forward 1<sup>m</sup>.

(a) The clock errors by these two stars are here and in many other instances very discordant. (b) Very great motion.  
(c) Note by the observer, '1° too little.' The observation has been altered accordingly. (d) Confused. (e) Wire IV  
was written down 43,7 and has been altered by a consideration of the intervals. (f) Misty and unsteady.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0h.	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
3.20. 4,53 3.22. 18,98 5.49.29,00 14.36.57,32 14.40.58,76 16.18.32,77 16.25.30,71 16.25.33,72 17. 6.17,70		+ 1,53	11,67 28,90 57,23 58,68 32,66 32,12 17,62	0,06 1,53 35,72 20,95	62,83 62,85 63,06 63,33	1,22	62,22	3.22. 14,06 5.50. 31,41 14.38. 0,19 14.42. 1,64 16.19.35,71 16.26.35,17 17. 7.20,71	☉'s center. Venus 1 L. ε Bootis. α <sup>2</sup> Libræ. Antares. Saturn's center. α Herculis.
3.23.59,83 3.26.14,41 16. 5.53,28 16.19.31,28 16.26.11,53 16.26.14,52 17. 7.16,62 1. 1. 6,93			7,03 53,20 31,17 12,92 16,53 59,30	57,34 35,74 20,97 3,02	4,14 4,57 4,44 3,72	1,23	63,53 3,53 1,17 4,65	3.26. 10,73 16. 5.57,55 16.19.35,53 16.26.17,29 17. 7.20,94 1. 1. 4,00	☉'s center. δ Ophiuchi. Antares. Saturn's center. α Herculis. Polaris.
3.28.55,60 3.51.10,32 5. 6.43,27 5.16. 2,38 16. 5.52,24 16.19.30,17 16.25.52,50 16.25.55,99 17. 7.15,67 1. 1. 6,36	0,97		2,87 43,19 2,29 52,16 30,06 54,14 15,59 58,73	48,15 7,18 57,35 35,76 20,99 3,57	4,96 4,89 5,19 5,70 5,40 4,84	1,20	5,89	3.30. 7,69 5. 6.48,09 5.16. 7,20 16. 5.57,59 16.19.35,50 16.25.59,59 17. 7.21,07 1. 1. 4,67	☉'s center. Rigel. β Tauri. δ Ophiuchi. Antares. Saturn's center. α Herculis. Polaris.
3.32.51,64 3.35. 6,64 6. 6. 6,29 7.50. 4,23 8.35.26,37 9.59.42,48 11. 4.56,89 11.40.46,13 12.36.32,35 12.36.35,82 12.47.51,91 12.55.36,17 13. 0.15,11 14.36.37,87 14.41.54,96 15. 8.33,51 15.20.25,04 15.29. 0,58 15.58.49,93 16. 5.51,08 16.19.29,13 16.25.33,50 16.25.36,76 16.38. 2,21 16.46.19,46 16.56.11,28 17. 7.14,14 1. 1. 4,86 2. 9. 3,54	45,99 55,60		59,05 6,19 4,13 26,28 42,40 56,81 46,05 34,00 51,82 36,09 58,00 37,74 54,88 33,43 24,94 0,49 49,67 51,00 29,02 35,03 2,13 19,38 11,21 14,06 57,23 3,46	48,94 52,59 3,84 1,55 57,36 35,78 21,01 4,10	6,54 6,54 5,84 6,67 6,36 6,76			3.34. 5,13 6. 6.12,40 7.50.10,43 8.35.32,62 9.59.48,81 11. 5. 3,28 11.40.52,55 12.36.40,55 12.47.58,38 12.55.42,66 1. 1. 4,57 14.36.44,40 14.42. 1,54 15. 8.40,11 15.20.31,63 15.29. 7,20 15.58.56,40 16. 5.57,73 16.19.35,76 16.25.41,78 16.38. 8,89 16.46.26,15 16.56.17,99 17. 7.20,85 1. 1. 4,40 2. 9.10,69	☉'s center. Venus 1 L. δ 1 L. δ Cancrī. Regulus. Mars 1 L. β Leonis. Jupiter's center. Pallas. Ceres. Polaris SP. 10 Hydræ Con. α <sup>2</sup> Libræ. * N.P.D. 97°. 16'. * N.P.D. 106°. 53'. τ <sup>2</sup> Serpēntis. θ Draconis. δ Ophiuchi. Antares. Saturn's center. i Herculis. ι Ophiuchi. * N.P.D. 76°. 10'. α Herculis. Polaris. Mercury 2 L.
3.36.48,56 3.39. 3,48	59,47		55,93		6,95 6,87	1,21	7,12	3.38. 3,23	☉'s center.

Error of Collimation = - 3'',22,

Level Error = + 1'',39.

Meridian Error from May 14 by Polaris, Polaris SP, and Polaris May 16 and 17.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
May 18	Rigel.....	59,9	13,7	27,2	40,8	54,8	7,9	5. 7. 21,8		B.
	$\beta$ Tauri.....	14,0	29,1	44,3	0,2	15,3	30,3	5. 16. 46,1		B.
	(a) Venus 1 L.....	33,3	48,2	3,7	18,2	33,5	48,1	6. 12. 3,6		B.
	Mars 1 L..... (cloudy)	10,8	24,1	37,5	51,2	5,0	18,4	11. 6. 32,2		B.
	$\beta$ Leonis.....	3,0	16,8	30,8	44,7	59,2	12,9	11. 41. 27,0		B.
May 20	Mars 1 L..... (cloudy)	4,7	18,3	31,8	45,3	59,1	12,9	11. 8. 26,1		B.
	$\beta$ Leonis.....	0,7	14,3	28,2	42,2	56,4	10,2	11. 41. 24,3		B.
	Ceres.....	3,1	16,8	30,2	44,1	57,8	11,1	12. 55. 24,9		B.
	Spica.....	54,5	7,9	21,5	35,4	49,3	3,1	13. 17. 16,4		B.
	11 Hydræ Con.....	9,4	24,3	39,0	54,1	9,1	23,4	14. 38. 39,1		B.
	$\alpha^2$ Libræ.....	9,2	23,0	37,1	51,0	5,2	19,1	14. 42. 33,1		B.
May 21	Regulus.....	55,9	10,1	23,8	37,4	51,6	5,2	10. 0. 19,1		B.
	Mars 1 L.....	4,3	18,0	31,4	45,0	58,9	12,2	11. 9. 26,0		B.
	$\gamma$ 1 L.....	53,4	7,1	21,0	34,9	49,0	2,4	11. 13. 16,5		B.
	$\beta$ Virginis.....	28,7	42,1	55,4	8,9	22,8	36,1	11. 42. 49,9		B.
	Jupiter 1 L.....	0,9	.....	27,8	.....	55,0	.....	12. 36. 22,0	- 0,07	B.
	Jupiter 2 L.....	.....	17,6	.....	44,4	.....	11,5	12. 36. ....	+ 0,09	B.
	Pallas.....	57,1	11,9	26,2	41,0	55,7	10,1	12. 48. 25,0		B.
	Ceres..... (hazy)	48,9	2,3	15,8	29,3	43,1	56,3	12. 55. 10,1		B.
	Spica.....	53,1	6,4	20,0	34,1	48,1	1,1	13. 17. 15,2		B.
	(b) $\gamma$ 8 Virginis.....	8,9	22,4	36,0	49,3	3,2	16,3	13. 26. 30,1		B.
	11 Hydræ Con.....	8,1	23,2	38,1	52,9	8,0	22,4	14. 38. 37,5		B.
	$\alpha^2$ Libræ.....	8,1	22,0	35,9	50,2	4,3	17,9	14. 42. 31,9		B.
	* N.P.D. 97°. 16'....	47,7	1,4	14,9	28,3	42,2	56,1	15. 9. 9,8		B.
	* N.P.D. 106°. 53'....	37,9	51,9	6,2	20,2	34,2	48,0	15. 21. 2,7		B.
	$\tau^2$ Serpentis.....	13,2	27,1	41,1	55,2	9,8	23,4	15. 29. 37,8		B.
	$\theta$ Ursæ Minoris.....	33. 3,1	34. 7,2	35. 11,1	36. 15,2	37. 20,5	38. 23,0	15. 39. 29,1		B.
	$\theta$ Draconis.....	57. 26,4	57. 52,5	58. 18,5	58. 44,9	59. 11,8	59. 37,1	16. 0. 3,9		B.
	$\delta$ Ophiuchi.....	5,3	19,1	52,3	46,1	59,9	13,2	16. 6. 26,7		B.
	Antares..... (flaming)	39,2	54,1	9,2	24,2	39,3	54,1	16. 20. 9,5		B.
	(c) Saturn 1 L.....	32,5	.....	1,2	.....	30,2	.....	16. 24. 59,0	- 0,07	B.
	Saturn 2 L.....	.....	50,3	.....	18,8	.....	47,9	16. 24. ....	+ 0,09	B.
May 22	(d) Jupiter 1 L.....	49,8	.....	16,9	.....	44,0	.....	12. 36. 11,0	- 0,07	B.
	Jupiter 2 L.....	.....	6,7	.....	33,3	.....	0,3	12. 36. ....	+ 0,09	B.
	$\delta$ Ophiuchi.....	4,3	17,8	31,4	45,2	58,2	11,8	16. 6. 25,3		B.
	Antares... } (very cloudy)	28,3	53,2	8,2	23,1	38,2	53,0	16. 20. 7,4		B.
May 23	$\odot$ 1 L.....	56,9	11,3	26,0	40,1	54,3	8,4	3. 57. 24,0		B.
	$\odot$ 2 L.....	12,9	27,3	42,0	56,2	10,8	25,0	3. 59. 39,5		B.
May 25	Mars 1 L.....	19,8	33,1	47,0	0,6	14,3	27,5	11. 13. 41,2		B.
	$\beta$ Leonis.....	54,7	8,8	22,6	36,5	50,9	4,5	11. 41. 18,9		B.
	Jupiter 1 L.....	20,2	.....	47,1	.....	15,0	.....	12. 35. 42,0	- 0,07	B.
	Jupiter 2 L.....	.....	36,9	.....	4,0	.....	30,7	12. 35. ....	+ 0,09	B.
	Pallas.....	9,4	24,1	38,7	53,1	8,0	22,2	12. 48. 37,1		B.
	Ceres.....	6,2	19,9	33,1	46,8	0,7	14,0	12. 54. 27,8		B.
	Spica.....	48,3	2,2	15,9	29,4	43,3	56,9	13. 17. 11,1		B.
	$\gamma$ 8 Virginis.....	4,3	18,1	31,2	45,1	58,7	12,2	13. 26. 25,4		B.
	$\alpha$ Virginis.....	12,2	26,2	40,1	54,2	8,9	22,6	13. 41. 37,2		B.
	$\gamma$ 1 L.....	35,9	50,0	4,2	18,9	33,4	47,9	14. 9. 2,8		B.
	11 Hydræ Con.....	4,1	18,5	33,3	48,2	3,8	18,1	14. 38. 33,1		B.
	$\alpha^2$ Libræ.....	3,8	17,3	31,4	45,3	59,9	13,4	14. 42. 27,8		B.
	(e) * N.P.D. 97°. 16'....	55,1	9,1	22,3	36,2	50,2	3,3	15. 7. 17,1		B.
	* N.P.D. 97°. 16'....	43,1	57,1	10,3	24,1	37,9	51,1	15. 9. 5,1		B.
	* N.P.D. 106°. 53'....	33,4	47,2	1,7	15,8	30,1	43,9	15. 20. 58,1		B.
	$\tau^2$ Serpentis.....	8,7	22,8	37,1	50,8	5,1	19,1	15. 29. 33,7		B.
	$\theta$ Ursæ Minoris.....	33. 58,3	34. 3,3	35. 7,2	36. 11,2	37. 16,4	38. 19,8	15. 39. 24,5		B.
	A.S.C. 1848.....	3,8	19,2	34,1	49,5	5,3	20,7	16. 1. 36,2		B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.

Transit levelled May 21, 0<sup>3h</sup>, and May 27, 1<sup>3h</sup>.

(a) Violent wind, which moved the Telescope.

(b) Note by the observer, 'it appears to-night of the 3rd or 4th magnitude.'

(c) Unsteady.

(d) Cloudy.

(e) Observed by mistake for the next star: the N.P.D. is conjectural.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
5. 6. 40,87 5. 15. 59,90 6. 11. 18,37 11. 5. 51,31 11. 40. 44,91		+ 1,53	40,79 59,81 18,27 51,23 44,83	48,15 7,18   52,58	7,36 7,37   7,75	1,21	7,12	5. 6. 48,17 5. 16. 7,20 6. 11. 25,70 11. 5. 58,91 11. 40. 52,54	Rigel. β Tauri. Venus 1 L. Mars 1 L. β Leonis.
11. 7. 45,46 11. 40. 42,33 12. 54. 44,00 13. 16. 35,44 14. 37. 54,05 14. 41. 51,10			45,42 42,30 43,96 35,38 53,96 51,04	 52,56  45,43  1,57	 10,26  10,05  10,53	1,20	9,62	11. 7. 55,60 11. 40. 52,50 12. 54. 54,22 13. 16. 45,66 14. 38. 4,31 14. 42. 1,39	Mars 1 L. β Leonis. Ceres. Spica. 11 Hydræ Con. α <sup>2</sup> Libræ.
9. 59. 37,59 11. 8. 45,11 11. 12. 34,90 11. 42. 9,13 12. 35. 41,35 12. 35. 44,59 12. 47. 41,00 12. 54. 29,40 13. 16. 34,00 13. 25. 49,46 14. 37. 52,88 14. 41. 50,04 15. 8. 28,63 15. 20. 20,15 15. 28. 55,37 15. 36. 15,60 15. 58. 45,01 16. 5. 46,09 16. 19. 24,23 16. 24. 15,65 16. 24. 19,09			37,56 45,07 34,85 9,09 42,92 40,96 29,36 33,94 49,42 52,79 49,98 28,58 20,08 55,33 15,02 44,86 46,06 24,13 17,29	48,90      45,43   1,58	11,34      11,49   11,60	1,17	10,81	9. 59. 48,86 11. 8. 56,42 11. 12. 46,21 11. 42. 20,47 12. 35. 54,34 12. 47. 52,39 12. 54. 40,80 13. 16. 45,39 13. 26. 0,88 14. 38. 4,31 14. 42. 1,51 15. 8. 40,13 15. 20. 31,64 15. 29. 6,89 15. 36. 26,59 15. 58. 56,45 16. 5. 57,65 16. 19. 35,74 16. 24. 28,90	Regulus. Mars 1 L. J 1 L. β Virginis. Jupiter's center. Pallas. Ceres. Spica. 78 Virginis. 11 Hydræ Con. α <sup>2</sup> Libræ. * N.P.D. 97°. 16'. * N.P.D. 106°. 53'. τ <sup>2</sup> Serpentis. θ Ursæ Minoris. θ Draconis. δ Ophiuchi. Antares. Saturn's center.
12. 35. 30,35 12. 35. 33,52 16. 5. 44,86 16. 19. 23,05			31,89 44,83 22,95	 57,43 35,86	 12,60 12,91	1,15	11,98	12. 35. 44,47 16. 5. 57,58 16. 19. 35,71	Jupiter's center. δ Ophiuchi. Antares.
3. 56. 40,14 3. 58. 56,24			48,16				13,13	3. 58. 1,48	☉'s center.
11. 13. 0,50 11. 40. 36,70 12. 35. 1,00 12. 35. 3,96 12. 47. 53,23 12. 53. 46,93 13. 16. 29,59 13. 25. 45,00 13. 40. 54,49 14. 8. 19,02 14. 37. 48,45 14. 41. 45,56 15. 6. 36,19 15. 8. 24,10 15. 20. 15,74 15. 28. 51,04 15. 36. 11,52 16. 0. 49,83		+ 1,08	0,42 36,64 2,39 53,15 46,85 29,49 44,92 54,38 18,91 48,32 45,46 36,09 24,00 15,63 50,96 10,90 49,69	52,51   45,42   1,60	15,87   15,93   16,14	1,26	15,27	11. 13. 16,28 11. 40. 52,52 12. 35. 18,32 12. 48. 9,09 12. 54. 2,80 13. 16. 45,45 13. 26. 0,89 13. 41. 10,37 14. 8. 34,92 14. 38. 4,36 14. 42. 1,50 15. 6. 52,15 15. 8. 40,06 15. 20. 31,70 15. 29. 7,04 15. 36. 26,99 16. 1. 5,80	Mars 1 L. β Leonis. Jupiter's center. Pallas. Ceres. Spica. 78 Virginis. α Virginis. J 1 L. 11 Hydræ Con. α <sup>2</sup> Libræ. * N.P.D. 97°. 16'. * N.P.D. 97°. 16'. * N.P.D. 106°. 53'. τ <sup>2</sup> Serpentis. θ Ursæ Minoris. A.S.C. 1848.

Error of Collimation = - 3",22.

Level Error = + 1",39. From May 20 = + 2",26. From May 25 = + 1",90.

The Meridian Error by β Leonis and Polaris May 17 (neglecting clock-rate) = + 1",32; by the same stars June 5, = + 0",69; by bisections of Grantchester cross on reversing the Transit June 6, = + 1",01; by Polaris SP May 17 and Polaris June 5, (allowing + 23",23 for loss of clock, and - 12",73 for change of R.) = + 1",08. As these values differ little from each other, the last is adopted from May 25.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
May 25	48 Serpentis.....	15,9	30,0	44,3	58,1	12,7	26,2	16. 4. 40,8		B.
	Saturn 1 L.....	14,3	.....	43,0	.....	12,0	.....	16. 23. 40,4	- 0,07	B.
	Saturn 2 L.....	.....	32,2	.....	0,7	.....	29,1	16. 23. ....	+ 0,09	B.
	(a) * N.P.D. 80°. 11'.....	21,1	34,6	48,8	2,3	16,2	29,9	16. 30. 43,3		B.
	i Herculis.....	12,1	26,2	39,4	53,2	7,1	20,1	16. 38. 33,9		B.
	i Ophiuchi.....	29,1	43,0	56,4	10,2	24,1	37,7	16. 46. 51,5		B.
	A.S.C. 1949.....	17,1	31,3	46,1	0,3	14,8	29,1	16. 55. 43,3		B.
	a Herculis.....	23,1	37,2	51,1	5,2	19,1	32,6	17. 7. 47,2		B.
May 26	$\alpha$ Virginis.....	11,1	24,9	39,0	53,2	7,9	21,3	13. 41. 36,2		B.
	$\alpha^2$ Libræ.....	2,4	16,2	30,0	44,2	58,2	12,1	14. 42. 26,2		B.
	) 1 L.....	54,9	9,7	25,0	39,9	54,7	9,4	14. 57. 24,6		B.
	$\alpha$ Coronæ Borealis....	52,1	7,7	22,9	37,8	53,1	8,2	15. 28. 23,7		B.
	$\chi$ Libræ.....	47,7	2,9	17,2	31,9	47,1	1,4	15. 31. 16,3		B.
	$\alpha$ Serpentis.....	25,1	39,1	52,2	6,0	19,5	33,1	15. 36. 46,9		B.
	b Scorpïi.....	19,2	34,2	49,1	4,0	19,0	34,1	15. 41. 49,0		B.
May 27	⊙ 1 L.....	59,8	14,4	28,9	43,1	58,0	12,7	4. 13. 27,0		B.
	⊙ 2 L.....	16,1	30,7	45,3	59,9	14,3	28,8	4. 15. 43,5		B.
	(b) Procyon.....	54,3	8,1	21,0	34,3	47,9	1,7	7. 31. 15,2		B.
	Pollux.....	23,7	39,0	56,5	10,1	25,2	40,3	7. 35. 55,8		B.
	Mars 1 L.....	36,4	50,0	3,6	17,0	30,9	44,1	11. 15. 58,0		B.
	$\beta$ Leonis.....	52,2	6,1	20,1	34,0	48,2	2,0	11. 41. 16,2		B.
	Jupiter 1 L.....	4,2	.....	31,0	.....	58,0	.....	12. 35. 25,0	- 0,07	B.
	Jupiter 2 L.....	.....	20,1	.....	47,3	.....	14,2	12. 35. ....	+ 0,09	B.
	Pallas.....	23,1	37,9	52,6	7,1	22,2	36,4	12. 48. 51,2		B.
	Spica.....	46,1	59,7	13,3	27,1	41,1	54,3	13. 17. 8,7		B.
	78 Virginis.....	2,1	15,5	29,0	42,3	56,1	9,3	13. 26. 23,1		B.
	A.S.C. 1673.....	6,7	20,3	35,1	49,4	4,0	18,2	14. 38. 32,8		B.
	* N.P.D. 97°. 16'.....	40,2	54,2	8,1	21,9	35,4	49,0	15. 9. 2,7		B.
	* N.P.D. 106°. 53'....	31,9	45,5	59,2	13,3	27,2	41,1	15. 20. 55,6		B.
	$\alpha$ Coronæ Borealis....	50,9	6,2	21,2	36,3	52,1	6,9	15. 28. 22,2		B.
	$\chi$ Libræ.....	47,1	2,0	16,2	30,8	45,9	0,3	15. 31. 15,2		B.
	$\alpha$ Serpentis.....	24,0	37,4	51,1	4,6	18,2	31,8	15. 36. 45,4		B.
	b Scorpïi.....	18,0	33,0	47,9	2,8	18,1	32,7	15. 41. 48,1		B.
	(c) ) 1 L.....	33,1	48,1	3,7	19,1	34,4	49,9	15. 49. 5,5		B.
	A.S.C. 1848.....	0,9	16,2	32,1	47,2	2,8	18,1	16. 1. 33,8		B.
	$\sigma$ Scorpïi.....	25,0	39,4	54,2	9,2	24,1	39,2	16. 11. 54,2		B.
	Antares.....	32,4	47,2	2,2	17,3	32,3	47,1	16. 20. 2,7		B.
	Saturn 1 L.....	34,3	.....	3,1	.....	32,1	.....	16. 23. 1,0	- 0,07	B.
	Saturn 2 L.....	.....	52,5	.....	21,2	.....	49,5	16. 22. ....	+ 0,09	B.
	* N.P.D. 80°. 11'.....	18,9	32,2	46,2	59,7	13,8	27,0	16. 30. 40,7		B.
	i Herculis.....	9,4	23,0	37,0	50,3	4,0	17,3	16. 38. 31,1		B.
	i Ophiuchi.....	26,7	40,1	53,9	7,9	21,3	35,1	16. 46. 49,0		B.
	A.S.C. 1949.....	15,0	29,2	43,2	57,8	12,7	26,1	16. 55. 41,1		B.
	a Herculis.....	20,8	34,7	48,5	2,9	17,0	30,3	17. 7. 44,5		B.
May 28	⊙ 1 L.....	1,7	16,2	30,7	45,2	59,7	14,2	4. 17. 28,8		B.
	⊙ 2 L.....	18,1	32,6	47,3	2,0	16,8	30,9	4. 19. 45,7		B.
	(d) Venus 1 L.....	2,5	17,8	32,3	46,8	2,1	16,9	7. 3. 32,1		B.
	Castor.....	12,7	28,3	44,1	0,1	16,1	31,9	7. 24. 48,0		B.
	Procyon.....	52,5	6,1	19,7	33,2	46,8	0,3	7. 31. 13,9		B.
	Pollux.....	22,7	37,9	53,2	8,6	23,9	39,0	7. 35. 54,6		B.
	Mars 1 L.....	46,9	0,7	14,1	27,6	41,4	54,8	11. 17. 8,6		B.
	$\beta$ Leonis.....	51,0	5,0	18,9	32,9	47,0	0,8	11. 41. 15,0		B.
	Jupiter 1 L.....	56,3	.....	23,9	.....	50,8	.....	12. 35. 17,4	- 0,07	B.
	Jupiter 2 L.....	.....	13,0	.....	40,0	.....	6,9	12. 35. ....	+ 0,09	B.
	Spica.....	44,9	58,4	12,1	26,1	39,7	53,2	13. 17. 6,9		B.
	A.S.C. 1673.....	4,9	19,4	33,8	48,1	2,8	17,1	14. 38. 31,8		B.
	* N.P.D. 97°. 16'.....	40,0	53,3	7,0	20,4	34,2	47,3	15. 9. 1,2		B.
	* N.P.D. 106°. 53'....	29,7	44,1	58,1	12,1	26,2	40,0	15. 20. 54,4		B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.

(a) The observation has been increased 5<sup>s</sup> to make it agree with subsequent observations. There is no star near the one intended.

(b) Faint and unsatisfactory.  
(c) Ragged limb and unsteady.  
(d) Great motion.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
16. 3. 58,29 16. 22. 57,35 16. 23. 0,76 16. 30. 2,31 16. 37. 53,14 16. 46. 10,28 16. 55. 0,28 17. 7. 5,07		+ 1,08	58,21 58,94 2,24 53,06 10,21 0,16 5,00	21,14	16,14	1,26	15,27	16. 4. 14,32 16. 23. 15,07 16. 30. 18,38 16. 38. 9,20 16. 46. 26,36 16. 55. 16,31 17. 7. 21,17	48 Serpentis. Saturn's center. * N.P.D. 80°. 11'. <i>i</i> Herculis. <i>i</i> Ophiuchi. A.S.C. 1949. <i>a</i> Herculis.
13. 40. 53,37 14. 41. 44,19 14. 56. 39,75 15. 27. 37,93 15. 30. 32,07 15. 36. 5,99 15. 41. 4,08			53,26 44,09 39,64 37,85 31,94 5,91 3,95	1,60 55,12 23,23	17,51 17,27 17,32	1,23	16,59	13. 41. 10,55 14. 42. 1,43 14. 56. 56,99 15. 27. 55,23 15. 30. 49,32 15. 36. 23,30 15. 41. 21,34	<i>x</i> Virginis. <i>a</i> <sup>2</sup> Libræ. D 1 L. <i>a</i> Coronæ Bor. <i>χ</i> Libræ. <i>a</i> Serpentis. <i>b</i> Scorpil.
4. 12. 43,41 4. 14. 59,80 7. 30. 34,64 7. 35. 10,08 11. 15. 17,15 11. 40. 34,11 12. 34. 44,48 12. 34. 47,29 12. 48. 7,22 13. 16. 27,19 13. 25. 42,48 14. 37. 49,50 15. 8. 21,64 15. 20. 13,40 15. 27. 36,55 15. 30. 31,07 15. 36. 4,64 15. 41. 2,94 15. 48. 19,12 16. 0. 47,30 16. 11. 9,33 16. 19. 17,32 16. 22. 17,55 16. 22. 21,16 16. 29. 59,79 16. 37. 50,30 16. 46. 7,72 16. 54. 57,87 17. 7. 2,67			51,54 34,56 10,00 17,07 34,05 45,80 7,14 27,09 42,40 49,38 21,54 13,29 36,47 30,94 4,56 2,81 18,99 47,16 9,20 17,19 19,24 59,72 50,22 7,65 57,75 2,60	52,67 27,96 52,50 45,41 23,23 21,17	18,11 17,96 18,45 18,32 18,65 18,67 18,57	1,21	17,77	4. 14. 9,52 7. 30. 52,71 7. 35. 28,15 11. 15. 35,41 11. 40. 52,41 12. 35. 4,20 12. 48. 25,55 13. 16. 45,53 13. 26. 0,88 14. 38. 7,89 15. 8. 40,07 15. 20. 31,83 15. 27. 55,02 15. 30. 49,49 15. 36. 23,12 15. 41. 21,37 15. 48. 37,56 16. 1. 5,74 16. 11. 27,78 16. 19. 35,78 16. 22. 37,84 16. 30. 18,32 16. 38. 8,83 16. 46. 26,27 16. 55. 16,37 17. 7. 21,23	☉'s center. Procyon. Pollux. Mars 1 L. <i>β</i> Leonis. Jupiter's center. Pallas. Spica. 78 Virginis. A.S.C. 1673. * N.P.D. 97°. 16'. * N.P.D. 106°. 53'. <i>a</i> Coronæ Bor. <i>χ</i> Libræ. <i>a</i> Serpentis. <i>b</i> Scorpil. D 1 L. A.S.C. 1848. <i>σ</i> Scorpil. Antares. Saturn's center. * N.P.D. 80°. 11'. <i>i</i> Herculis. <i>i</i> Ophiuchi. A.S.C. 1949. <i>a</i> Herculis.
4. 16. 45,21 4. 19. 1,91 7. 2. 47,22 7. 24. 0,17 7. 30. 33,21 7. 35. 8,56 11. 16. 27,73 11. 40. 32,94 12. 34. 37,03 12. 34. 40,06 13. 16. 25,90 14. 37. 48,27 15. 8. 20,48 15. 20. 12,08			53,49 47,15 0,09 33,13 8,48 27,65 32,88 38,46 25,80 48,15 20,38 11,97	19,69 52,66 27,96 52,49 45,41	19,60 19,53 19,48 19,61 19,61	1,28	19,06	4. 18. 12,78 7. 3. 6,58 7. 24. 19,54 7. 30. 52,59 7. 35. 27,94 11. 16. 47,31 11. 40. 52,56 12. 34. 58,19 13. 16. 45,57 14. 38. 7,99 15. 8. 40,25 15. 20. 31,85	☉'s center. Venus 1 L. Castor. Procyon. Pollux. Mars 1 L. <i>β</i> Leonis. Jupiter's center. Spica. A.S.C. 1673. * N.P.D. 97°. 16'. * N.P.D. 106°. 53'.

Error of Collimation = -3",22.

Level Error = +1",90.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
May 28	(a) Mercury 2 L.....	8,7	22,5	36,5	49,9	4,5	17,7	2.46.31,4		B.
May 29	☉ 1 L.....	4,1	18,4	33,1	47,3	2,4	16,7	4.21.31,3		B.
	☉ 2 L.....	21,0	35,5	49,9	4,4	19,2	33,4	4.23.48,2		B.
	Venus 1 L.....	7,1	21,7	36,4	51,2	6,4	21,0	7.8.36,3		B.
	Castor.....	11,4	27,0	43,1	59,1	15,0	30,9	7.24.47,0		B.
	Procyon.....	51,3	5,1	18,4	31,9	46,0	59,1	7.31.12,7		B.
	Pollux.....	21,3	36,5	52,1	7,1	22,9	37,7	7.35.53,4		B.
	Mars 1 L.....	59,0	12,7	26,1	39,8	53,5	7,0	11.18.20,7		B.
	β Leonis.....	49,9	3,9	17,7	31,9	45,9	59,4	11.41.14,0		B.
	Jupiter 1 L.....	49,7	.....	16,9	.....	44,1	.....	12.35.11,0	- 0,07	B.
	Jupiter 2 L.....	.....	6,7	.....	33,7	.....	0,2	12.35. ....	+ 0,09	B.
	Spica.....	43,6	57,2	11,2	24,5	38,4	52,3	13.17.6,2		B.
	A.S.C. 1673.....	3,9	18,6	32,9	47,2	2,1	16,2	14.38.30,6		B.
	Saturn 1 L.....	55,1	.....	23,8	.....	52,9	.....	16.22.21,0	- 0,07	B.
	Saturn 2 L.....	.....	13,1	.....	41,3	.....	10,1	16.22. ....	+ 0,09	B.
	* N.P.D. 76°. 10'.....	16,0	29,1	43,2	57,2	11,2	24,8	16.56.39,0		B.
	α Ophiuchi.....	24,7	39,9	54,7	10,0	25,1	39,3	17.5.55,1		B.
	θ Ophiuchi.....	5,3	20,0	35,1	49,9	5,0	19,3	17.12.34,5		B.
	ρ Herculis.....	58,9	16,1	32,6	49,5	6,7	23,2	17.18.40,9		B.
	α Ophiuchi..... (blezing)	28,0	41,9	55,5	9,2	23,4	37,1	17.27.51,0		B.
	δ 2 L.....	32,9	48,1	4,6	20,1	36,1	52,0	17.44.8,2		B.
	δ Sagittarii.....	37,1	52,1	8,1	23,2	39,1	54,2	18.11.10,1		B.
	λ Sagittarii.....	59,1	14,3	29,0	44,0	59,1	14,1	18.18.28,9		B.
May 30	(b) ☉ 1 L.....	7,0	21,3	35,9	50,4	4,9	19,5	4.25.34,2		B.
	☉ 2 L.....	23,7	38,1	52,9	7,2	22,2	36,1	4.27.51,2		B.
	(b) Venus 1 L.....	10,1	25,0	39,8	54,9	9,9	24,2	7.13.39,9		B.
	(b) Castor.....	9,4	25,1	41,2	57,3	14,1	29,4	7.24.45,8		B.
	(b) Procyon.....	50,2	3,9	17,4	30,9	44,5	58,1	7.31.11,9		B.
	Pollux.....	20,1	35,5	50,8	6,0	21,7	36,5	7.35.52,1		B.
	Regulus.....	45,8	59,4	13,2	27,0	41,1	54,8	10.0.8,9		B.
	Mars 1 L.....	12,9	26,3	40,0	53,4	7,1	20,4	11.19. ....	+ 6,81	B.
	β Leonis.....	48,9	2,9	16,7	30,6	45,0	58,3	11.41.13,0		B.
May 31	(c) Mercury 2 L.....	29,5	43,2	56,7	10,4	24,8	38,4	3.0.53,2		B.
June 1	☉ 1 L.....	13,7	28,2	42,7	57,4	12,4	26,3	4.33.41,3		B.
	☉ 2 L.....	30,9	45,2	0,1	14,7	29,3	43,6	4.35.58,4		B.
	Venus 1 L.....	13,4	28,1	43,0	57,9	13,1	27,8	7.23.42,9		B.
	Procyon.....	47,9	1,7	14,8	28,2	42,1	55,3	7.31.9,1		B.
	Pollux.....	17,7	32,7	48,2	3,7	19,1	34,1	7.35.49,7		B.
	Mars 1 L..... (haze)	43,5	57,0	10,9	24,1	37,9	51,0	11.22.5,0		B.
	β Leonis..... (Temp. 54°)	46,0	0,1	13,9	28,0	42,0	55,7	11.41.10,0		B.
	Jupiter 1 L.....	33,7	.....	0,6	.....	27,4	.....	12.34.54,8	- 0,07	B.
	Jupiter 2 L.....	.....	50,0	.....	16,9	.....	43,8	12.34. ....	+ 0,09	B.
	* N.P.D. 106°. 53'.....	24,9	39,1	53,2	7,1	21,2	35,1	15.20.49,1		B.
	τ² Serpentis.....	59,9	14,1	28,2	42,2	56,2	10,4	15.29.24,8		B.
	16 Scorpii.....	21,4	35,1	48,8	2,3	16,1	29,4	16.3.43,3		B.
	Saturn 1 L.....	55,8	.....	24,1	.....	53,0	.....	16.21.21,9	- 0,07	B.
	Saturn 2 L.....	.....	13,5	.....	41,7	.....	10,5	16.21. ....	+ 0,09	B.
	* N.P.D. 80°. 11'.....	12,8	26,1	39,8	53,2	7,1	20,7	16.30.34,8		B.
	* N.P.D. 76°. 10'.....	12,1	26,0	39,7	53,2	7,6	21,1	16.56.35,2		B.
	α Herculis..... (Temp. 47°)	14,7	28,8	42,9	56,2	10,4	24,1	17.7.38,2		B.
June 4	(d) Jupiter 1 L.....	23,9	.....	50,8	.....	18,0	.....	12.34. ....	+ 13,46	B.
	Jupiter 2 L.....	.....	39,9	.....	7,1	.....	.....	12.34. ....	+ 13,55	B.
	Arcturus.....	11,0	25,4	39,7	54,1	8,9	22,7	14.8.37,2		B.
	(e) Saturn 1 L.....	57,1	.....	25,8	.....	54,6	.....	16.19. ....	+ 14,26	B.
	Saturn 2 L.....	.....	14,3	.....	42,8	.....	11,5	16.20. ....	+ 0,09	B.
	α Herculis..... (Temp. 51°)	11,7	25,5	39,5	53,3	7,5	21,0	17.7.35,4		B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.

The Transit levelled June 6, 6<sup>h</sup>, just before the reversion.

(a) Great motion.

(b) Much unsteadiness. The clock-error by Castor is too large.

(c) Very cloudy and unsteady. Wire IV was marked 'doubtful.'

(d) Hazy.

(e) Cloudy. The observation gives the diameter too small.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
2. 45. 50,18		+ 1,08	50,11			1,17	20,24	2. 46. 10,49	Mercury 2 L.
4. 20. 47,62			56,00					4. 22. 16,45	☉'s center.
4. 23. 4,51			51,37					7. 8. 11,96	Venus 1 L.
7. 7. 51,44			59,00	19,69	20,69			7. 24. 19,60	Castor.
7. 23. 59,08			31,99	52,66	20,67			7. 30. 52,60	Procyon.
7. 30. 32,07			7,21	27,95	20,74			7. 35. 27,82	Pollux.
7. 35. 7,29			39,75					11. 18. 0,54	Mars 1 L.
11. 17. 39,83			31,75	52,48	20,73			11. 40. 52,56	β Leonis.
11. 40. 31,81			31,90					12. 34. 52,75	Jupiter's center.
12. 34. 30,35			24,67	45,41	20,74			13. 16. 45,56	Spica.
12. 34. 33,62			47,24					14. 38. 8,19	A.S.C. 1673.
13. 16. 24,77			39,74					16. 22. 0,78	Saturn's center.
14. 37. 47,36			56,95					16. 56. 18,01	* N.P.D. 76°. 10'.
16. 21. 38,13			9,70					17. 5. 30,77	A Ophiuchi.
16. 21. 41,59			49,75					17. 12. 10,83	θ Ophiuchi.
16. 55. 57,22			49,60					17. 18. 10,68	ρ Herculis.
17. 5. 9,83			9,38	30,43	21,05			17. 27. 30,47	α Ophiuchi.
17. 11. 49,88			20,14					17. 43. 41,24	γ 2 L.
17. 17. 49,70			23,27					18. 10. 44,40	δ Sagittarii.
17. 27. 9,45			43,94					18. 18. 5,07	λ Sagittarii.
17. 43. 20,28									
18. 10. 23,41									
18. 17. 44,07									
4. 24. 50,45			58,83			1,23	21,44	4. 26. 20,50	☉'s center.
4. 27. 7,35			54,76					7. 13. 16,57	Venus 1 L.
7. 12. 54,83			57,39	19,68	22,29			7. 24. 19,21	Castor.
7. 23. 57,47			30,90	52,65	21,75			7. 30. 52,72	Procyon.
7. 30. 30,98			6,02	27,95	21,93			7. 35. 27,85	Pollux.
7. 35. 6,10			27,10	48,80	21,70			9. 59. 49,05	Regulus.
9. 59. 27,17			53,41					11. 19. 15,43	Mars 1 L.
11. 18. 53,49			30,71	52,47	21,76			11. 40. 52,75	β Leonis.
11. 40. 30,77									
3. 0. 10,88			10,81			1,25	23,95	3. 0. 34,92	Mercury 2 L.
4. 32. 57,43			5,95					4. 34. 30,14	☉'s center.
4. 35. 14,60			57,95					7. 23. 22,28	Venus 1 L.
7. 22. 58,03			28,37	52,65	24,28			7. 30. 52,71	Procyon.
7. 30. 28,45			3,52	27,94	24,42			7. 35. 27,86	Pollux.
7. 35. 3,60			24,12					11. 21. 48,66	Mars 1 L.
11. 21. 24,20			27,90	52,45	24,55			11. 40. 52,46	β Leonis.
11. 40. 27,96			15,43					12. 34. 40,03	Jupiter's center.
12. 34. 14,05			6,99					15. 20. 31,74	* N.P.D. 106°. 53'
12. 34. 16,99			42,17					15. 29. 6,93	τ <sup>2</sup> Serpentis.
15. 20. 7,10			2,24					16. 3. 27,02	16 Scorpii.
15. 28. 42,25			40,19					16. 21. 4,99	Saturn's center.
16. 3. 2,34			53,43					16. 30. 18,24	* N.P.D. 80°. 11'
16. 20. 38,63			53,49					16. 56. 18,32	* N.P.D. 76°. 10'.
16. 20. 41,99			56,40	21,24	24,84			17. 7. 21,24	α Herculis.
16. 29. 53,50									
16. 55. 53,56									
17. 6. 56,47									
12. 34. 4,36		+ 0,69	5,62			1,29	26,98	12. 34. 33,28	Jupiter's center.
12. 34. 7,05			54,08	21,77	27,69			14. 8. 21,82	Arcturus.
14. 7. 54,14			41,40					16. 20. 9,26	Saturn's center.
16. 19. 40,09			53,35	21,27	27,92			17. 7. 21,25	α Herculis.
16. 19. 42,96									
17. 6. 53,41									

Error of Collimation = - 3",22.

Level Error = + 1",90. From June 4 = + 2",36.

Meridian Error from June 4 by β Leonis and Polaris June 5. The allowance for clock-rate was inadvertently omitted.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.		
June 4	$\alpha$ Ophiuchi.....	21,2	35,0	48,8	2,6	16,7	30,1	17.27.44,0		B.
June 5	Mars 1 L.....	1,0	14,5	28,0	41,4	55,2	8,7	11.27.22,2		B.
	$\beta$ Leonis..... (Temp. 50°)	41,2	55,1	9,3	23,0	37,4	51,0	11.41.5,2		B.
	$\gamma$ 2 L..... (hazy)	33,4	47,3	1,4	15,0	28,9	42,3	0.6.56,6		B.
	Polaris.....	35.55,5	44.12,8	52.31,3	0.49,5	9.17,4	17.22,6	1.25.53,7		B.
	(a) Mercury 2 L.....	28,0	42,1	56,2	10,0	24,3	38,1	3.28.52,3		B.
June 6	$\odot$ 1 L.....	38,8	53,1	7,9	22,4	37,1	51,6	4.54.6,8		B.
	$\odot$ 2 L.....	56,0	11,2	25,1	40,0	55,1	9,0	4.56.24,2		B.
	Castor.....	2,1	17,4	33,1	49,4	5,7	21,2	7.24.37,3		B.
	Procyon.....	41,9	55,3	8,9	22,1	36,0	49,2	7.31.3,1		B.
	Pollux.....	11,8	27,0	42,2	57,6	13,1	28,1	7.35.43,8		B.
	Venus 1 L..... (cloudy)	0,1	14,8	29,3	44,1	58,4	13,2	7.48.28,4		B.
	(b) $\alpha^2$ Libræ.....	48,9	2,8	16,7	31,2	44,9	59,0	14.42.12,9		B.
	$\alpha$ Coronæ Borealis.....	38,7	54,1	9,1	24,2	39,4	54,3	15.28.10,0		B.
June 7	$\alpha^2$ Libræ.....	47,4	2,1	15,3	29,7	44,0	57,4	14.42.11,7		B.
	$\alpha$ Coronæ Borealis.....	37,1	53,0	8,0	23,1	38,1	53,2	15.28.8,6		B.
June 8	$\odot$ 2 L..... (very cloudy)	8,1	23,0	37,3	52,2	7,0	21,9	5.4.36,1		B.
	$\alpha$ Coronæ Borealis.....	36,3	51,7	6,3	21,9	37,0	52,0	15.28.7,2		B.
	$\alpha$ Serpentis.....	9,0	22,8	36,1	50,1	4,1	17,0	15.36.30,7		B.
	16 Scorpis.....	12,9	26,9	40,2	54,1	7,5	21,1	16.3.34,5		B.
	Saturn 1 L.....	38,9	.....	7,0	.....	35,8	.....	16.19.4,5	+ 0,07	B.
	Saturn 2 L.....	.....	56,4	.....	25,0	.....	53,4	16.19. ....	- 0,09	B.
	$\eta$ Herculis.....	29,2	42,9	56,2	10,2	23,9	37,1	16.24.50,8		B.
	* N.P.D. 80°. 11'.....	3,8	17,9	30,9	44,8	58,8	12,3	16.30.26,1		B.
	* N.P.D. 76°. 10'.....	3,1	17,1	30,9	45,1	59,1	12,7	16.56.26,5		B.
	* N.P.D. 61°. 0'.....	13,1	28,5	43,6	59,3	14,9	30,1	17.12.45,2		B.
	$\rho$ Herculis.....	46,1	3,8	20,0	37,1	54,1	11,0	17.18.27,9		B.
	$\alpha$ Ophiuchi.....	15,1	29,7	43,1	57,1	11,1	24,5	17.27.38,2		B.
June 9	Polaris.....	.....	.....	52.15,7	0.43,4	9.0,2	17.17,8	1.25.36,6	- 8.19,00	B.
	(c) Mercury 2 L.....	39,6	54,3	8,4	22,9	37,6	51,4	3.55.5,8		B.
	Aldebaran..... (cloud)	.....	.....	52,4	6,2	20,1	34,0	4.26.48,1	- 14,04	B.
June 10	$\odot$ 1 L.....	4,0	18,9	33,3	48,3	2,8	17,7	5.10.32,2		B.
	$\odot$ 2 L.....	21,9	37,0	50,9	6,1	20,8	35,3	5.12.50,0		B.
	Mars 1 L.....	4,7	18,2	31,4	45,1	59,0	12,2	11.34.25,8		B.
	$\beta$ Leonis..... (cloudy)	34,1	48,7	2,3	16,7	30,3	44,2	11.40.58,3		B.
	Jupiter 1 L.....	20,2	.....	47,3	.....	14,8	.....	12.34.41,9	+ 0,07	B.
	Jupiter 2 L.....	.....	37,1	.....	3,9	.....	30,8	12.34. ....	- 0,09	B.
	Polaris SP.....	.....	44.14,6	52.30,3	0.48,8	9.16,2	17.23,5	13. ....	+ 1,16	B.
June 11	$\odot$ 1 L.....	11,1	26,1	40,8	55,4	10,3	24,7	5.14.39,5		B.
	$\odot$ 2 L.....	29,2	44,1	58,3	13,7	28,0	43,1	5.16.57,5		B.
	Castor.....	54,9	11,1	26,6	42,6	58,7	14,8	7.24.30,5		B.
	Venus 1 L..... (dancing)	10,0	24,9	39,1	54,0	8,6	23,1	8.12.37,9		B.
	$\delta$ Ophiuchi.....	40,1	53,9	7,2	20,6	34,1	47,4	16.6.1,1		B.
	Polaris.....	35.35,7	44.6,3	52.13,5	0.38,8	8.56,4	17.16,2	1. ....	+ 4.9,57	B.
June 12	$\odot$ 1 L.....	18,4	33,5	47,7	3,1	17,8	32,1	5.18.47,0		B.
	$\odot$ 2 L.....	36,2	51,3	5,9	21,0	35,4	50,0	5.21.5,0		B.
	Castor.....	53,8	10,0	25,2	41,8	57,4	13,3	7.24.29,9		B.
	Mars 1 L..... (cloudy)	2,2	15,8	29,0	42,9	26,2	9,7	11.37.23,3		B.
	$\beta$ Leonis..... (Temp. 71°)	32,5	46,4	0,1	14,2	28,1	42,2	11.40.56,0		B.
	(d) Jupiter 1 L.....	24,7	.....	51,6	.....	19,0	.....	12.34.45,9	+ 0,07	B.
	Jupiter 2 L.....	.....	41,2	.....	8,3	.....	35,1	12.34. ....	- 0,09	B.
	Polaris SP.....	.....	44.14,5	52.32,7	0.48,7	9.15,4	17.23,6	13.25.53,3	- 4.9,57	B.
	$\delta$ Ophiuchi.....	39,0	52,3	6,1	19,2	33,0	46,2	16.5.59,7		B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.  
 From  $\alpha^2$  Libræ June 6..... EAST. .... ABCDEFG.  
 The Transit reversed June 6, 6 $\frac{1}{2}$ h, and levelled immediately after.  
 The Transit levelled June 11, 22 $\frac{1}{2}$ h.

(a) Cloudy and unsatisfactory.  
 (b) Bad illumination of the wires.

(c) Dancing dreadfully.  
 (d) Cloudy and faint.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
17.27.263		+0,69	2,57	30,51	27,94	1,29	26,98	17.27.30,49	$\alpha$ Ophiuchi.
11.26.41,57			41,49			1,50	28,57	11.27.10,77	Mars 1 L.
11.40.23,17	23,08		23,11	52,41	29,30			11.40.52,41	$\beta$ Leonis.
0.6.14,99			14,90			1,23	29,92	0.6.44,83	$\gamma$ 2 L.
1.0.51,83	48,37		47,36	16,57	29,21			1.1.17,33	Polaris.
3.28.10,14			10,08					3.28.40,18	Mercury 2 L.
4.53.22,53									
4.55.40,08			31,24					4.55.1,41	$\odot$ 's center.
7.23.49,46			49,40	19,67	30,27			7.24.19,70	Castor.
7.30.22,35			22,27	52,64	30,37			7.30.52,57	Procyon.
7.34.57,66			57,61	27,93	30,32			7.35.27,92	Pollux.
7.47.44,04			43,97					7.48.14,29	Venus 1 L.
14.41.30,91		-0,48	30,97	1,62	30,65			14.42.1,64	$\alpha^2$ Libræ.
15.27.24,26			24,47	55,15	30,68			15.27.55,18	$\alpha$ Coronæ Bor.
14.41.29,66			29,72	1,62	31,90	1,26	31,13	14.42.1,62	$\alpha^2$ Libræ.
15.27.23,01			23,22	55,15	31,93			15.27.55,16	$\alpha$ Coronæ Bor.
5.3.52,23			52,42			1,31	32,38	5.4.25,08	$\odot$ 2 L.
15.27.21,77			21,98	55,15	33,17			15.27.55,21	$\alpha$ Coronæ Bor.
15.35.49,97			50,11	23,29	33,18			15.36.23,34	$\alpha$ Serpentis.
16.2.53,89			53,98					16.3.27,23	16 Scorpil.
16.18.21,62								16.13.56,55	Saturn's center.
16.18.24,84			23,28						
16.24.10,04			10,18					16.24.43,46	$n$ Herculis.
16.29.44,94			45,09					16.30.18,37	* N.P.D. 80°.11'.
16.55.44,93			45,09					16.56.18,39	* N.P.D. 76°.10'.
17.11.59,25			59,48					17.12.32,80	* N.P.D. 61°.0'.
17.17.37,15			37,42					17.18.10,74	$\rho$ Herculis.
17.26.56,97			57,13	30,56	33,43			17.27.30,46	$\alpha$ Ophiuchi.
1.0.39,74	45,26		45,96	19,85	33,89	1,24	35,18	1.1.21,19	Polaris.
3.54.22,85			22,99					3.54.58,37	Mercury 2 L.
4.26.6,12			6,24	41,58	35,34			4.26.41,65	Aldebaran.
5.9.48,17									
5.12.6,00			57,24					5.11.32,69	$\odot$ 's center.
11.33.45,20			45,30					11.34.21,08	Mars 1 L.
11.40.16,37			16,50	52,36	35,86			11.40.52,28	$\beta$ Leonis.
12.34.1,12									
12.34.3,84			2,55					12.34.38,38	Jupiter's center.
13.0.51,84	46,55		45,80	20,28	34,48			1.1.21,65	Polaris SP.
5.13.55,42		-1,25				1,16	36,25	5.15.41,05	$\odot$ 's center.
5.16.13,41			4,54						
7.23.42,74			42,91	19,67	36,76			7.24.19,52	Castor.
8.11.53,94			54,06					8.12.30,70	Venus 1 L.
16.5.20,63			20,72	57,60	36,88			16.5.57,75	$\delta$ Ophiuchi.
1.0.37,39	42,91		44,74	21,53	36,79	1,26	37,46	1.1.22,25	Polaris.
5.18.2,80									
5.20.20,68			11,86					5.19.49,60	$\odot$ 's center.
7.23.41,63			41,80	19,68	37,88			7.24.19,65	Castor.
11.36.42,73			42,79					11.37.20,86	Mars 1 L.
11.40.14,21			14,31	52,34	38,03			11.40.52,38	$\beta$ Leonis.
12.34.5,37									
12.34.8,11			6,77					12.34.44,89	Jupiter's center.
13.0.51,80	46,51		44,55	21,93	37,38			1.1.22,69	Polaris SP.
16.5.19,36			19,45	57,61	38,16			16.5.57,75	$\delta$ Ophiuchi.

Error of Collimation = -3",22. From  $\alpha^2$  Libræ June 6 = -0",01. See Introduction.

Level Error = +2",36. From  $\alpha^2$  Libræ June 6 = +3",40. From June 9 = +2",68.

Meridian Error from  $\alpha^2$  Libræ June 6 by Polaris June 9 and Polaris SP. June 10, allowing +0",56 for loss of clock, and -0",43 for change of  $\mathcal{R}$ .

Meridian Error from June 11 by Polaris June 11 and Polaris SP June 12, allowing +0",59 for loss of clock and -0",40 for change of  $\mathcal{R}$ .



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.		II.		III.		IV.		V.		VI.		VII. Wire.			Correction to Mean of Wires Observed.	Observer.
		m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	h.	m.	s.		
June 12	Saturn 1 L.....	22,8	...	...	...	51,0	...	...	...	19,3	...	...	...	16. 17. 48,0			+ 0,07	B.
	Saturn 2 L.....	...	...	40,0	...	...	...	8,4	...	...	...	37,1	...	16. 17. ....			- 0,09	B.
	$\alpha$ Ophiuchi.....	10,3	24,4	38,2	52,0	6,0	19,7	17. 27. 33,4										B.
June 13	(a) $\odot$ 1 L.....	26,0	41,0	55,3	10,6	25,1	39,5	5. 22. 54,2										B.
	$\odot$ 2 L.....	44,0	58,9	13,3	28,2	43,0	57,7	5. 25. 12,4										B.
June 15	$\delta$ Ophiuchi.....	35,1	49,0	2,2	15,9	29,3	42,8	16. 5. 56,0										B.
	Saturn 1 L.....	26,1	...	54,9	...	23,5	...	16. 16. 52,0									+ 0,07	B.
	Saturn 2 L.....	...	44,3	...	12,9	...	41,1	16. 16. ....									- 0,09	B.
	$\alpha$ Herculis.....	57,1	11,2	25,1	39,1	52,9	6,9	17. 7. 20,8										B.
	(b) * N.P.D. 57°. 11'.....	13,3	29,4	45,7	1,9	17,5	33,5	17. 18. 50,1										B.
June 16	$\alpha$ Ophiuchi.....	7,0	20,7	34,1	48,3	2,2	15,9	17. 27. 30,2										B.
	Regulus..... (Temp. 63°)	23,9	37,9	51,3	5,7	19,2	33,1	9. 59. 46,9										B.
	$\gamma$ 1 L..... (cloudy)	29,4	43,6	57,8	12,0	26,1	40,2	10. 7. 54,2										B.
	$\delta$ Ophiuchi.....	33,7	47,4	0,8	14,4	27,9	41,3	16. 5. 55,1										B.
	$\alpha$ Herculis.....	55,9	10,1	23,8	38,1	51,9	5,7	17. 7. 19,8										B.
	$\alpha$ Ophiuchi.....	5,6	19,5	33,2	47,2	1,2	15,1	17. 27. 28,5										B.
	Polaris..... (cloudy)	...	...	52.15,6	...	8.58,3	17.14,7	1. 25. 34,4									- 10. 22,85	B.
	Aldebaran.....	15,2	29,4	43,2	57,3	11,6	25,4	4. 26. 39,6										B.
	Mercury 2 L.....	11,5	26,4	40,5	55,6	10,4	24,7	4. 49. 39,3										B.
	(c) $\odot$ 1 L.....	58,1	13,1	27,5	42,6	57,1	12,1	5. 39. 26,5										B.
June 17	$\odot$ 2 L.....	16,2	31,5	45,4	0,9	15,5	30,2	5. 41. 45,0										B.
	Castor.....	47,0	3,4	19,1	35,0	51,1	7,2	7. 24. 23,0										B.
	Procyon.....	27,5	41,3	54,6	8,3	22,0	35,2	7. 30. 49,0										B.
	Pollux.....	57,4	13,1	28,0	43,7	58,9	14,0	7. 35. 29,3										B.
	Venus 1 L.....	17,2	32,2	46,5	1,0	15,3	29,6	8. 40. 44,0										B.
	Regulus..... (Temp. 66°)	22,3	36,1	50,0	4,0	17,9	31,5	9. 59. 45,3										B.
	$\gamma$ 1 L.....	23,5	37,7	51,2	5,3	19,1	33,0	10. 54. 47,0										B.
	$\beta$ Leonis.....	25,4	39,8	53,4	7,7	21,8	35,4	11. 40. 49,4										B.
	Mars 1 L.....	45,0	58,8	12,1	25,7	39,1	52,5	11. 45. 6,2										B.
	Jupiter 1 L.....	47,0	...	14,0	...	41,2	...	12. 35. 8,0									+ 0,07	B.
	Jupiter 2 L.....	...	3,4	...	30,4	...	57,3	12. 34. ....									- 0,09	B.
	Polaris SP..... (cloudy)	...	...	52.27,8	0.45,8	9.11,6	17.19,7	13. 25. 49,4									- 8. 19,09	B.
	(d) Polaris.....	...	...	...	0.39,8	8.54,7	17.13,4	1. 25. 30,6									- 12. 29,56	B.
	(e) Mercury 2 L.....	51,3	6,2	20,4	35,3	50,2	4,8	4. 58. 19,5										B.
June 18	$\odot$ 1 L.....	6,1	21,0	35,6	50,4	5,3	20,0	5. 43. 34,4										B.
	$\odot$ 2 L.....	24,4	39,3	54,0	9,0	23,3	38,2	5. 45. 53,1										B.
	$\alpha$ Coronæ Borealis.....	23,6	39,1	54,0	9,1	24,4	39,5	15. 27. 54,6										B.
June 19	$\gamma$ 1 L.....	16,0	30,2	43,7	57,7	11,6	25,3	12. 22. 39,1										B.
	(f) Jupiter 1 L.....	0,1	...	26,6	...	54,2	...	12. 35. 21,2									+ 0,07	B.
	Jupiter 2 L.....	...	16,6	...	43,9	...	10,4	12. 35. ....									- 0,09	B.
	Polaris SP.....	...	44. 9,3	52.26,7	0.44,5	9.10,6	17.17,8	13. 25. 49,4									- 4. 9,55	B.
	$\epsilon$ Bootis.....	26,6	42,3	57,2	12,8	28,4	43,0	14. 37. 58,1										B.
	$\alpha^2$ Libræ.....	32,0	46,1	0,1	14,0	28,0	41,9	14. 41. 56,2										B.
	$\phi$ Libræ.....	11,9	26,1	40,1	54,7	9,0	23,2	15. 29. 37,1										B.
	T Herculis.....	17,9	32,8	47,2	2,4	17,2	31,8	16. 4. 46,2										B.
	Saturn 1 L.....	13,7	...	42,0	...	11,2	...	16. 15. 40,0									+ 0,07	B.
	Saturn 2 L.....	...	31,9	...	0,3	...	28,5	16. 15. ....									- 0,09	B.
	Antares..... (blazing)	54,7	19,2	33,3	49,2	3,9	19,2	16. 19. 33,5										B.
	$\eta$ Herculis.....	15,1	29,0	42,2	56,1	9,7	23,0	16. 24. 36,9										B.
	$\alpha$ Herculis.....	51,8	6,0	19,9	33,9	48,0	1,5	17. 7. 15,4										B.
	* N.P.D. 57°. 11'.....	8,1	24,2	39,9	56,0	12,2	28,0	17. 18. 44,0										B.
	$\alpha$ Ophiuchi.....	1,5	15,7	29,2	43,1	56,8	10,9	17. 27. 24,2										B.
June 20	(g) Polaris..... (hazy)	35.29,7	44. 0,8	52. 6,5	0.35,7	8.52,3	17.10,8	1. 25. 30,4										B.
	(h) Mercury 2 L.....	44,2	59,4	14,2	23,8	43,5	58,4	5. 16. 13,4										B.
	$\odot$ 1 L. } $\odot$ 2 L. }..... (cloudy)	...	...	52,1	7,2	21,9	36,2	5. 51. 51,3									- 14,74	B.
		40,9	55,7	10,1	25,1	39,8	54,4	5. 53. ....									+ 7,37	B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, *ABCDEFGH*.  
The Transit levelled June 17, 1<sup>h</sup>.

- |  |               |   |            |
|--|---------------|---|------------|
| (a) Cloudy and unsteady.   | (b) Confused. | (e) Extremely unsteady.   | (f) Faint. |
| (c) Much unsteadiness in the observations of this day.   |               | (g) Wire II appearing by the intervals to be too small, has been increased 10 <sup>s</sup> conjecturally. |            |
| (d) Very cloudy. Wire IV was written down 49,8, and has been altered by considering the intervals. |               | (h) Very great motion.  |            |

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adapt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
16. 17. 5,34 16. 17. 8,41 17. 26. 52,00		- 1,25	6,85 52,09	30,61	38,52	1,26	37,46	16. 17. 45,16 17. 27. 30,46	Saturn's center. $\alpha$ Ophiuchi.
5. 22. 10,24 5. 24. 28,22			19,36				38,72	5. 23. 58,36	$\odot$ 's center.
16. 5. 15,76 16. 16. 9,19 16. 16. 12,68 17. 6. 39,02 17. 18. 1,63 17. 26. 48,35		- 0,66	15,85 10,94 39,12 1,78 48,44	57,62 21,38 30,64	41,77 42,26 42,20	1,27	41,19	16. 5. 57,89 16. 16. 52,99 17. 7. 21,22 17. 18. 43,89 17. 27. 30,55	$\delta$ Ophiuchi. Saturn's center. $\alpha$ Herculis. * N.P.D. 57°. 11'. $\alpha$ Ophiuchi.
9. 59. 5,43 10. 7. 11,90 16. 5. 14,37 17. 6. 37,90 17. 26. 47,19 1. 0. 37,90 4. 25. 57,39 4. 48. 55,49	42,64		5,52 11,99 14,46 38,00 47,28 43,60 57,49 55,61	48,66 57,62 21,39 30,65 25,13 41,72	43,14 43,16 43,39 43,37 41,53 44,23	1,37 1,44	42,40 43,94	9. 59. 48,49 10. 7. 54,97 16. 5. 57,78 17. 7. 21,38 17. 27. 30,68 1. 1. 27,60 4. 26. 41,69 4. 49. 39,84	Regulus. $\gamma$ 1 L. $\delta$ Ophiuchi. $\alpha$ Herculis. $\alpha$ Ophiuchi. Polaris. Aldebaran. Mercury 2 L.
5. 38. 42,43 5. 41. 0,64 7. 23. 35,11 7. 30. 8,27 7. 34. 43,48 8. 40. 0,82 9. 59. 3,86 10. 54. 5,26 11. 40. 7,56 11. 44. 25,63 12. 34. 27,62 12. 34. 30,28 13. 0. 47,77 1. 0. 35,07 4. 57. 35,39	43,22 39,81		51,66 35,26 8,35 43,62 0,93 3,95 5,34 7,66 25,70 29,00 42,19 40,77 35,51	19,69 52,64 27,93 48,65 52,29	44,43 44,29 44,51 44,70 44,63			5. 40. 35,94 7. 24. 19,64 7. 30. 52,74 7. 35. 28,01 8. 40. 45,39 9. 59. 48,49 10. 54. 49,93 11. 40. 52,30 11. 45. 10,34 12. 35. 13,69	$\odot$ 's center. Castor. Procyon. Pollux. Venus 1 L. Regulus. $\gamma$ 1 L. $\beta$ Leonis. Mars 1 L. Jupiter's center.
5. 42. 50,40 5. 45. 8,76 15. 27. 9,19			59,70 9,33	55,13	45,80			5. 44. 45,00 15. 27. 55,13	$\odot$ 's center. $\alpha$ Coronæ Bor.
12. 21. 57,66 12. 34. 40,59 12. 34. 43,54 13. 0. 46,83 14. 37. 12,63 14. 41. 14,04 15. 28. 54,59 16. 4. 2,21 16. 14. 56,79 16. 15. 0,14 16. 18. 49,00 16. 23. 56,00 17. 6. 33,78 17. 17. 56,06 17. 26. 43,06 1. 0. 32,31 5. 15. 28,85	42,28	- 1,63	57,65 42,07 39,73 12,74 14,00 54,53 2,30 58,40 48,91 56,03 33,84 56,19 43,11 39,43 28,93	26,99 59,98 1,61 30,68 27,39	47,26 47,24 47,61 47,24 47,57	1,43 1,29	46,49 47,72	12. 22. 44,88 12. 35. 29,31 1. 1. 27,00 14. 38. 0,10 14. 42. 1,36 15. 29. 41,94 16. 4. 49,75 16. 15. 45,86 16. 19. 36,37 16. 24. 43,50 17. 7. 21,35 17. 18. 43,72 17. 27. 30,64 1. 1. 27,20 5. 16. 16,93	$\gamma$ 1 L. Jupiter's center. Polaris SP. $\epsilon$ Bootis. $\alpha^2$ Libræ. $\phi$ Libræ. T Herculis. Saturn's center. Antares. $n$ Herculis. $\alpha$ Herculis. * N.P.D. 57°. 11'. $\alpha$ Ophiuchi. Polaris. Mercury 2 L.
5. 51. 7,00 5. 53. 25,04	37,05		16,10					5. 53. 4,14	$\odot$ 's center.

Error of Collimation = - 0'',01.

Level Error = + 2'',68. From June 15 = + 2'',29.

Meridian Error from June 15 by Polaris, Polaris SP, and Polaris June 16 and 17.

..... from June 19 by Polaris SP and Polaris June 19, allowing + 0'',69 for loss of clock and - 0'',40 for change of  $\mathcal{R}$ .



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
June 20	Pollux.....	53,2	9,0	24,0	39,7	55,1	10,2	7.35.25,6		B.
	(a) Venus 1 L.....	57,4	12,1	26,0	40,7	55,0	9,3	8.54.23,3		B.
	Regulus.....	18,7	33,0	46,6	0,8	14,4	28,0	9.59.41,9		B.
	Rigel.....	17,8	31,8	45,1	58,8	12,9	26,1	5.6.39,9		B.
	(b) Mercury 2 L.....	56,1	10,4	25,2	39,8	54,6	9,4	5.25.24,4		B.
June 21	☉ 1 L.....	30,9	45,8	0,4	15,3	29,9	44,6	5.55.59,4		B.
	☉ 2 L.....	49,1	4,1	18,8	34,0	48,5	3,2	5.58.18,0		B.
	Pollux.....	52,0	7,7	22,9	38,0	53,4	9,0	7.35.24,2		B.
	Antares.....	1,1	16,5	31,1	46,6	1,1	16,2	16.19.31,2		B.
	α Ophiuchi.....	58,3	13,1	26,6	40,3	54,2	8,1	17.27.21,5		B.
June 22	β Leonis.....	19,0	33,3	46,8	1,1	14,9	28,9	11.40.43,1		B.
	(c) Jupiter 1 L.....	.....	38,0	.....	5,3	.....	32,5	12.35. ....	- 0,09	B.
	Jupiter 2 L.....	.....	.....	55,7	.....	22,4	.....	12.35.48,4	- 13,46	B.
	Spica.....	12,6	26,7	40,1	53,9	7,9	21,2	13.16.35,0		B.
	δ Ophiuchi.....	25,6	39,2	52,9	6,3	20,1	33,2	16.5.47,0		B.
June 24	☉ 1 L.....	55,7	10,9	25,2	40,1	54,9	.....	6.8.24,2	+ 4,92	B.
	☉ 2 L.....	14,1	28,5	43,1	58,0	12,9	27,4	6.10.42,1		B.
	(d) Procyon.....	18,2	32,0	45,2	.....	.....	26,3	7.30. ....	+ 13,58	B.
	(d) Venus 1 L.....	.....	.....	14,3	28,6	42,8	56,4	9.12.10,5	- 14,23	B.
	(d) Mars 1 L.....	14,0	27,8	40,8	54,3	8,0	21,7	11.56.35,2		B.
	(e) Jupiter 1 L.....	.....	58,0	.....	25,3	.....	52,3	12.35. ....	- 0,09	B.
	Jupiter 2 L.....	.....	.....	14,4	.....	41,4	.....	12.36.8,1	- 13,45	B.
	(d) δ Ophiuchi.....	23,0	37,1	50,3	4,1	17,4	.....	16.5. ....	+ 13,52	B.
	(d) Saturn 1 L.....	48,0	.....	17,0	.....	45,2	.....	16.14.14,0	+ 0,07	B.
	Saturn 2 L.....	.....	5,8	.....	34,2	.....	2,9	16.14. ....	- 0,09	B.
	♃ 1 L.....	33,0	49,0	4,2	20,1	36,0	51,3	16.23.7,0		B.
	(d) A Ophiuchi.....	.....	.....	22,0	37,2	52,1	7,0	17.5.22,0	- 15,05	B.
	α Ophiuchi.....	55,1	9,1	22,7	36,8	50,8	4,4	17.27.18,2		B.
	(d) θ Herculis.....	.....	.....	.....	53,0	10,0	26,7	17.50.43,4	- 25,47	B.
June 25	(d) ☉ 2 L.....	21,9	36,7	51,1	6,0	21,0	35,8	6.14.50,1		B.
	Procyon.....	.....	.....	.....	58,0	11,6	25,1	7.30.38,4	- 20,37	B.
	(f) Venus 1 L.....	8,0	22,1	36,0	50,4	.....	.....	9.16.33,2	+ 8,53	B.
	(g) Jupiter 1 L.....	54,6	.....	21,5	.....	49,0	.....	12.36.16,1	+ 0,07	B.
	Jupiter 2 L.....	.....	11,3	.....	38,5	.....	5,3	12.36. ....	- 0,09	B.
	Polaris SP.....	.....	44.2,4	52.21,2	0.37,8	9.8,3	17.13,6	13. ....	+ 1,16	B.
June 26	Polaris..... (clouds)	.....	.....	.....	0.34,4	.....	17.10,6	1.25.29,5	- 13.52,95	B.
	Rigel.....	10,9	24,8	38,1	51,8	5,4	19,0	5.6.32,5		B.
June 28	☉ 1 L.....	27,3	42,4	57,0	12,0	26,8	41,4	6.24.56,0		B.
	☉ 2 L.....	45,3	0,5	15,1	30,0	44,9	59,2	6.27.14,6		B.
	Procyon.....	.....	.....	.....	.....	8,1	21,5	7.30.35,0	- 27,12	B.
July 1	(h) Venus 1 L.....	42,9	57,4	11,0	25,3	39,2	53,2	9.42.7,4		B.
	Polaris SP.....	.....	43.58,7	52.20,6	0.36,3	9.3,5	17.11,3	13.25.41,5	- 4.9,56	B.
	δ Ophiuchi.....	15,4	29,1	42,3	56,1	9,7	23,1	16.5.36,4		B.
	Saturn 1 L.....	58,7	.....	26,9	.....	55,5	.....	16.12.24,1	+ 0,07	B.
	Saturn 2 L.....	.....	16,3	.....	44,4	.....	12,9	16.12. ....	- 0,09	B.
	α Herculis.....	37,5	51,8	5,7	19,9	33,8	47,2	17.7.0,9		B.
	* N.P.D. 61°. 0'.....	44,9	0,6	15,3	31,1	46,1	2,0	17.12.16,9		B.
	* N.P.D. 57°. 11'.....	53,6	10,1	25,9	41,8	58,0	14,0	17.18.30,0		B.
	α Ophiuchi.....	47,1	1,3	15,0	28,7	42,8	56,4	17.27.10,1		B.
	* N.P.D. 48°. 12'.....	14,4	32,9	50,5	9,1	27,0	45,1	17.46.3,1		B.
	(d) ☉ 2 L.....	21,4	.....	.....	5,0	20,4	35,0	6.47.49,9	- 8,81	B.
July 3	(g) Venus 1 L.....	.....	.....	27,8	42,2	56,3	10,2	9.50.24,3	- 13,98	B.
	(i) δ Ophiuchi.....	12,9	26,2	39,8	53,9	7,3	20,9	16.5.34,3		B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, *ABCDEFGH*.  
Transit levelled June 25, 1<sup>h</sup>, and July 3, 2<sup>1</sup>/<sub>4</sub><sup>h</sup>.

- |  |                                    |                            |
|--|------------------------------------|----------------------------|
| (a) Very great motion.   | (d) Very cloudy.                   | (e) Cloudy and very faint. |
| (b) The first five wires have each been increased 10°.                                 | (f) Cloudy and unsteady.           | (g) Very hazy and faint.   |
| (c) Confused. The planet was very faint and the observation altogether unsatisfactory. | (h) Hazy and very unsteady.        |                            |
|  | (i) Bad illumination of the wires. |                            |

Concluded Transit over the Mean of the seven Wires.			Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>s.</i>	<i>''</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h.</i> <i>m.</i> <i>s.</i>	
7.34.39,55				-1,63	39,66	27,94	48,28	1,29	47,72	7.35.27,79	Pollux.
8.53.40,54					40,62					8.54.28,82	Venus 1 L.
9.59.0,48					0,53	48,63	48,10			9.59.48,79	Regulus.
5.5.58,92					58,90	48,44	49,54	1,40	49,21	5.6.48,41	Rigel.
5.24.39,99					40,08					5.25.29,60	Mercury 2 L.
5.55.15,19					24,51					5.57.14,07	☉'s center.
5.57.33,67										7.35.27,93	Pollux.
7.34.38,17						27,95	49,67			16.19.36,33	Antares.
16.18.46,26						36,16	49,99			17.27.30,58	α Ophiuchi.
17.26.40,30					40,35	30,70	50,35				
11.40.1,01					1,05	52,24	51,19	1,27	50,57	11.40.52,24	β Leonis.
12.35.5,18					6,94					12.35.58,18	Jupiter's center.
12.35.8,71										13.16.45,14	Spica.
13.15.53,91					53,87	45,26	51,39			16.5.57,78	δ Ophiuchi.
16.5.6,33					6,36	57,64	51,28				
6.7.40,09				-0,50	49,16			1,28	52,99	6.9.42,48	☉'s center.
6.9.58,02										7.30.52,46	Procyon.
7.29.59,00					59,07	52,67	53,60			9.12.21,86	Venus 1 L.
9.11.28,29					28,38					11.56.48,22	Mars 1 L.
11.55.54,54					54,59					12.36.20,19	Jupiter's center.
12.35.25,11					26,53					16.5.57,83	δ Ophiuchi.
12.35.27,85										16.14.26,54	Saturn's center.
16.5.3,90					3,98	57,64	53,66			16.23.13,93	γ 1 L.
16.13.31,12					32,69					17.5.30,90	α Ophiuchi.
16.13.34,21										17.27.30,73	α Ophiuchi.
16.22.20,08					20,07					17.50.46,89	θ Herculis.
17.4.37,01					37,00						
17.26.36,73					36,81	30,72	53,91				
17.49.52,80					52,95						
6.14.6,09					6,19			1,25	54,32	6.15.0,83	☉ 2 L.
7.29.57,90					57,97	52,68	54,71			7.30.52,68	Procyon.
9.15.50,47					50,56					9.16.45,36	Venus 1 L.
12.35.35,37					36,88					12.36.31,85	Jupiter's center.
12.35.38,28										1.1.32,08	Polaris SP.
13.0.41,82	37,86				37,08	32,21	55,13			1.1.33,24	Polaris.
1.0.31,88	36,01				36,74	33,47	56,73	1,28	56,45	5.6.48,54	Rigel.
5.5.51,78					51,82	48,54	56,72				
6.24.11,84					20,99			1,30	57,80	6.26.19,14	☉'s center.
6.26.29,94										7.30.52,68	Procyon.
7.29.54,41					54,48	52,69	58,21				
9.41.25,20					25,27			1,15	60,96	9.42.26,69	Venus 1 L.
13.0.39,09					34,87	36,84	61,97			1.1.36,45	Polaris SP.
16.4.56,01					56,08	57,65	61,57			16.5.57,81	δ Ophiuchi.
16.11.41,37					42,91					16.12.44,64	Saturn's center.
16.11.44,44										17.7.21,40	α Herculis.
17.6.19,55					19,62	21,46	61,84			17.12.32,87	* N.P.D. 61°.0'.
17.11.30,98					31,08					17.18.43,82	* N.P.D. 57°.11'.
17.17.41,91					42,03					17.27.30,64	α Ophiuchi.
17.26.28,78					28,85	30,76	61,91			17.46.10,83	* N.P.D. 48°.12'.
17.45.8,88					9,02						
6.47.5,53				-0,81	5,61			1,21	63,27	6.48.9,22	☉ 2 L.
9.49.42,18					42,24					9.50.46,01	Venus 1 L.
16.4.53,61					53,66	57,64	63,98			16.5.57,74	δ Ophiuchi.

Error of Collimation = -0",01.

Level Error = +2",29. From June 22 = +1",98. From July 1 = +1",71.

Meridian Error from June 24 by Polaris SP June 25 and Polaris June 26, allowing +1",59 for loss of clock, and -1",26 for change of *R*.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
July 3	Saturn 1 L.....	29,9	.....	58,0	.....	27,0	.....	16.11.55,1	+ 0,07	B.
	Saturn 2 L.....	.....	47,4	.....	15,9	.....	44,1	16.11. ....	- 0,09	B.
	Antares.....	47,1	2,1	16,9	32,1	47,1	2,1	16.19.17,0		B.
	29 Scorpii.....	27,0	42,4	57,1	12,5	27,3	42,4	17. 3. 57,8		B.
	* N.P.D. 57°. 11'.....	50,9	7,8	23,2	39,7	55,6	11,9	17.18.27,9		B.
	$\alpha$ Ophiuchi.....	44,9	59,1	12,7	26,8	40,2	54,0	17.27. 8,1		B.
	* N.P.D. 48°. 12'.....	12,1	30,8	48,4	6,9	24,4	42,9	17.46. 0,9		B.
	$\theta$ Herculis.....	52,0	9,0	25,6	42,9	59,8	16,7	17.50.33,5		B.
	* N.P.D. 44°. 18'.....	30,6	50,2	9,2	28,7	47,9	7,1	18. 0.26,6		B.
	(a) A.S.C. 2151.....	.....	.....	14,7	29,0	42,9	57,1	18.28.11,1	- 14,13	B.
July 4	(b) $\odot$ 1 L.....	10,7	25,3	39,9	55,0	9,3	.....	6.49. ....	+ 14,69	B.
	$\odot$ 2 L.....	28,5	43,1	57,3	12,1	27,0	41,4	6.51.56,3		B.
	Mercury 1 L... (motion)	31,1	46,0	0,8	15,9	30,6	45,2	7.28. 0,1		B.
	(c) Mars 1 L.....	52,4	6,1	19,3	32,7	46,3	59,9	12.14.13,4		B.
	Jupiter 1 L.....	59,2	.....	26,1	.....	53,1	.....	12.38.20,2	+ 0,07	B.
	Jupiter 2 L.....	.....	16,2	.....	42,4	.....	9,7	12.38. ....	- 0,09	B.
	Polaris SP.....	35.39,3	43.55,5	52.17,3	0.34,6	9. 1,8	17. 8,6	13.25.39,2		B.
	$\delta$ Ophiuchi.....	11,7	25,3	39,4	52,3	5,8	19,1	16. 5.33,0		B.
	(d) Saturn 1 L.....	15,1	.....	44,0	.....	12,7	.....	16.11.41,0	+ 0,07	B.
	Saturn 2 L.....	.....	32,8	.....	1,5	.....	30,1	16.11. ....	- 0,09	B.
	$\alpha$ Herculis.....	33,8	48,1	2,2	16,3	29,9	44,0	17. 6.57,4		B.
	$\alpha$ Ophiuchi.....	44,0	57,9	11,2	25,2	39,1	53,0	17.27. 6,9		B.
	$\theta$ Herculis.....	50,2	8,0	24,1	41,4	58,2	15,1	17.50.32,0		B.
July 5	Venus 1 L.....	9,9	23,9	37,1	51,3	5,1	19,0	9.58.32,9		B.
	$\beta$ Leonis.....	3,9	17,8	31,5	45,7	59,9	13,6	11.40.27,5		B.
	(e) Mars 1 L.....	42,7	56,4	9,8	23,3	37,0	50,6	12.16. 4,1		B.
	Polaris SP.....	35.44,4	44. 3,2	52.20,7	0.36,2	9. 3,3	17.11,5	13.25.42,4		B.
	(f) $\delta$ Ophiuchi.....	10,3	24,0	37,3	51,2	4,7	18,1	16. 5.31,4		B.
	$\alpha$ Ophiuchi.....	42,4	56,6	10,2	24,1	37,9	52,0	17.27. 5,6		B.
	$\theta$ Herculis.....	47,1	6,9	23,1	40,1	57,1	14,1	17.50.30,9		B.
	* N.P.D. 44°. 18'.....	28,1	47,2	6,7	26,0	45,2	4,9	18. 0.24,0		B.
	Polaris.....	.....	43.56,5	52. 6,3	.....	8.47,8	17. 7,4	1.25.24,7	- 4.59,96	B.
	$\beta$ Arietis.....	56,7	11,1	25,1	39,7	54,1	8,4	1.45.22,7		B.
	$\alpha$ Arietis.....	16,9	31,7	45,9	0,8	15,4	29,8	1.57.44,4		B.
	Rigel.....	0,4	14,0	27,4	41,1	54,9	8,6	5. 6.22,1		B.
	$\beta$ Tauri.....	14,4	29,7	44,9	0,6	15,8	30,7	5.15.46,2		B.
July 6	$\odot$ 1 L.}	22,6	37,7	52,0	6,8	21,4	36,1	6.57.50,5		B.
	$\odot$ 2 L.} ..... (hazy)	40,1	54,4	9,2	24,1	38,9	53,4	7. 0. 8,1		B.
	Procyon.....	4,7	18,3	31,5	45,1	58,8	12,4	7.30.26,0		B.
	Pollux.....	34,3	50,1	5,3	20,8	35,8	51,2	7.35. 6,5		B.
	(g) Mercury 1 L.....	59,2	14,1	28,6	43,4	58,3	12,8	7.45.27,6		B.
	Regulus..... (Temp. 65°)	.....	.....	27,0	40,9	54,5	8,8	9.59.22,3	- 13,84	B.
	(g) Venus 1 L.....	11,1	25,8	39,0	53,1	7,0	20,5	10. 2.34,4		B.
	(g) Mars 1 L.....	33,4	47,3	0,8	14,4	28,0	41,3	12.17.55,6		B.
	Polaris SP.....	35.43,2	44. 2,7	52.20,5	0.37,6	9. 4,4	17.12,8	13.25.42,4		B.
	(h) $\delta$ Ophiuchi.....	9,0	22,8	36,2	49,9	3,4	17,0	16. 5.30,2		B.
	Saturn 1 L.....	48,0	.....	16,2	.....	45,1	.....	16.11.13,3	+ 0,07	B.
	Saturn 2 L.....	.....	5,7	.....	34,1	.....	2,5	16.11. ....	- 0,09	B.
	Antares.....	43,2	58,3	13,1	28,2	43,1	58,1	16.19.13,0		B.
	* N.P.D. 57°. 11'.....	47,4	3,9	19,5	35,8	51,9	7,7	17.18.23,7		B.
	$\alpha$ Ophiuchi..... (blazing)	41,1	55,2	9,0	22,9	36,5	50,1	17.27. 4,1		B.
	* N.P.D. 48°. 12'.....	7,4	26,2	44,0	2,8	20,9	38,9	17.45.56,7		B.
	(i) $\theta$ Herculis.....	47,3	5,1	21,4	39,2	55,9	13,0	17.50.29,3		B.
	* N.P.D. 44°. 18'.....	26,7	46,2	5,1	24,9	44,1	3,2	18. 0.22,5		B.
July 10	$\odot$ 2 L.....	59,4	.....	.....	43,7	58,2	12,6	7.16.27,2	- 8,77	B.
	Rigel.....	54,0	7,8	21,4	35,1	48,8	2,6	5. 6.16,1		B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, ABCDEFG.  
The Transit levelled July 12, 2<sup>h</sup>.

- (a) Differs 1" from subsequent observations of the same star.  
 (b) Very cloudy and unsteady.  
 (c) Disturbed. (d) Very hazy.  
 (e) Faint and unsteady.

- (f) Hurried, and bad illumination of the wires. Wires I and II were written down 9,3 and 23,0, and have been altered conjecturally.  
 (g) Great unsteadiness. (h) Disturbed: not good.  
 (i) Intervals unsatisfactory.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
16. 11. 12,57 16. 11. 15,71 16. 18. 32,05 17. 3. 12,35 17. 17. 39,58 17. 26. 26,54 17. 45. 6,63 17. 49. 42,78 17. 59. 28,62 18. 27. 28,83		- 0,81	14,13 32,02 12,31 39,69 26,59 6,77 42,90 28,77 28,82	36,19 30,77	64,17 64,18	1,21	63,27	16. 12. 18,22 16. 19. 36,11 17. 4. 16,44 17. 18. 43,84 17. 27. 30,74 17. 46. 10,94 17. 50. 47,07 18. 0. 32,95 18. 28. 33,02	Saturn's center. Antares. 29 Scorpii. * N.P.D. 57°. 11'. $\alpha$ Ophiuchi. * N.P.D. 48°. 12'. $\theta$ Herculis. * N.P.D. 44°. 18'. A.S.C. 2151.
6. 48. 54,73 6. 51. 12,24 7. 27. 15,67 12. 13. 32,87 12. 37. 39,72 12. 37. 42,68 13. 0. 36,61 16. 4. 52,37 16. 10. 58,27 16. 11. 1,38 17. 6. 15,96 17. 26. 25,33 17. 49. 41,28	33,17		3,57 15,75 32,90 41,22 31,90 52,42 59,81 16,02 25,38 41,40	39,19 57,64	67,29 65,22	1,24	64,48	6. 51. 8,40 7. 28. 20,62 12. 14. 38,01 12. 38. 46,35 1. 1. 37,05 16. 5. 57,73 16. 12. 5,13 17. 7. 21,38 17. 27. 30,76 17. 50. 46,80	$\odot$ 's center. Mercury 1 L. Mars 1 L. Jupiter's center. Polaris SP. $\delta$ Ophiuchi. Saturn's center. $\alpha$ Herculis. $\alpha$ Ophiuchi. $\theta$ Herculis.
9. 57. 51,31 11. 39. 45,70 12. 15. 23,41 13. 0. 40,24 16. 4. 51,00 17. 26. 24,11 17. 49. 39,90 17. 59. 26,01 1. 0. 28,58 1. 44. 39,69 1. 57. 0,70 5. 5. 41,21 5. 15. 0,32	36,80		51,37 45,77 23,44 35,53 51,05 24,16 40,02 26,16 33,35 39,76 0,78 41,22 0,41	52,12 40,06 57,64 30,77	66,35 64,53 66,59 66,61	1,31	65,70	9. 58. 57,61 11. 40. 52,11 12. 16. 29,81 1. 1. 41,94 16. 5. 57,63 17. 27. 30,81 17. 50. 46,69 18. 0. 32,84 1. 1. 40,47 1. 45. 46,92 1. 58. 7,95 5. 6. 48,57 5. 16. 7,77	Venus 1 L. $\beta$ Leonis. Mars 1 L. Polaris SP. $\delta$ Ophiuchi. $\alpha$ Ophiuchi. $\theta$ Herculis. * N.P.D. 44°. 18'. Polaris. $\beta$ Arietis. $\alpha$ Arietis. Rigel. $\beta$ Tauri.
6. 57. 6,73 6. 59. 24,03 7. 29. 45,26 7. 34. 20,57 7. 44. 43,43 9. 58. 40,86 10. 1. 52,91 12. 17. 14,40 13. 0. 40,51 16. 4. 49,79 16. 10. 30,72 16. 10. 34,01 16. 18. 28,15 17. 17. 35,70 17. 26. 22,70 17. 45. 2,41 17. 49. 38,75 17. 59. 24,67	32,17		33,35 39,76 0,78 41,22 0,41	40,51	67,16	1,38	67,06	1. 1. 40,47 1. 45. 46,92 1. 58. 7,95 5. 6. 48,57 5. 16. 7,77	
6. 57. 6,73 6. 59. 24,03 7. 29. 45,26 7. 34. 20,57 7. 44. 43,43 9. 58. 40,86 10. 1. 52,91 12. 17. 14,40 13. 0. 40,51 16. 4. 49,79 16. 10. 30,72 16. 10. 34,01 16. 18. 28,15 17. 17. 35,70 17. 26. 22,70 17. 45. 2,41 17. 49. 38,75 17. 59. 24,67	37,07		15,46 45,30 20,67 43,51 40,91 52,96 14,43 35,80 49,84 32,35 28,12 35,81 22,75 2,55 38,87 24,82	52,75 28,07 48,57 40,98 57,64 36,18 30,77	67,45 67,40 67,66 65,18 67,80 68,06 68,02			6. 59. 22,92 7. 30. 52,79 7. 35. 28,17 7. 45. 51,01 9. 59. 48,54 10. 3. 0,60 12. 18. 22,19 1. 1. 43,61 16. 5. 57,82 16. 11. 40,34 16. 19. 36,11 17. 18. 43,87 17. 27. 30,81 17. 46. 10,63 17. 50. 46,95 18. 0. 32,91	$\odot$ 's center. Procyon. Pollux. Mercury 1 L. Regulus. Venus 1 L. Mars 1 L. Polaris SP. $\delta$ Ophiuchi. Saturn's center. Antares. * N.P.D. 57°. 11'. $\alpha$ Ophiuchi. * N.P.D. 48°. 12'. $\theta$ Herculis. * N.P.D. 44°. 18'.
7. 15. 43,45 5. 5. 35,11			43,54 35,12	48,82	73,70	1,43	71,68 73,11	7. 16. 55,65 5. 6. 48,53	$\odot$ 2 L. Rigel.

Error of Collimation = -0",01.

Level Error = +1",71. From July 10 = +1",88.

The Meridian Error by Polaris SP July 4, and Polaris July 5, allowing +2",16 for loss of clock and -1",32 for change of  $\mathcal{R}$ . = -0",05; by Polaris SP, Polaris, and Polaris SP July 5 and 6, = -1",57. The mean of these is used from July 3.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
July 11	(a) ☉ 1 L.....	47,0	1,7	15,8	30,8	45,3	0,1	7.18.14,7		B.
	☉ 2 L.....	3,8	18,8	32,8	47,6	2,4	17,1	7.20.31,2		B.
	Procyon.....	58,8	12,4	25,7	39,3	53,0	6,8	7.30.20,2		B.
	(b) Venus 1 L.....	53,2	7,1	20,6	34,9	48,7	....	10.22. ....	+ 13,79	B.
	(b) Mars 1 L.....	0,5	14,2	27,7	41,2	54,7	8,0	12.28. ....	+ 6,76	B.
	Jupiter 1 L.} .....	6,6	....	33,8	....	1,0	....	12.41. ....	+ 13,60	B.
	Jupiter 2 L.} .....	....	22,7	....	49,7	....	16,6	12.41. ....	- 0,09	B.
	Spica..... (cloud)	....	....	17,4	31,4	45,0	58,5	13.17.12,4	- 13,70	B.
	Arcturus.....	24,1	38,9	52,9	7,4	21,9	36,1	14. 8.50,5		B.
July 12	α Ophiuchi.....	33,4	47,4	1,2	15,1	28,9	42,8	17.27.56,4		B.
	γ Draconis.....	33,9	56,2	17,2	39,1	1,1	22,4	17.53.44,1		B.
	(c) Rigel.....	51,6	5,7	18,9	32,8	46,3	59,6	5. 7.13,2		B.
	β Tauri.....	5,7	21,0	36,1	51,8	7,0	21,9	5.16.37,6		B.
July 13	☉ 1 L.....	53,3	8,1	22,2	37,3	51,9	6,2	7.27.20,9		B.
	☉ 1 L.....	10,0	24,6	39,1	54,0	8,4	23,1	7.29.27,8		B.
	Mercury 1 L.....	19,4	34,1	48,2	3,0	17,1	31,8	8.41.46,0		B.
	(c) Regulus.....	50,2	4,3	18,0	31,8	45,7	59,8	10. 0.13,3		B.
	Venus 1 L.....	32,4	46,2	0,1	14,0	27,9	41,3	10.30.55,0		B.
	(d) Jupiter 1 L.....	47,8	....	15,0	....	42,0	....	12.42. 9,0	+ 0,07	B.
	Jupiter 2 L.....	....	4,1	....	31,0	....	57,7	12.41. ....	- 0,09	B.
July 14	(e) Procyon.....	....	....	19,3	33,3	47,1	0,5	7.31.14,0	- 13,55	B.
July 15	☉ 1 L.....	57,9	12,6	27,1	41,5	56,2	10,9	7.35.23,2		B.
	☉ 2 L.....	14,1	28,9	43,3	58,2	12,8	27,0	7.37.41,7		B.
	(f) Mercury 1 L.....	26,3	40,8	54,8	9,5	24,0	38,0	8.55. ....	+ 7,16	B.
	(f) Venus 1 L.....	4,9	18,7	32,1	45,9	59,6	....	10.37. ....	+ 13,71	B.
	☾ 1 L..... (cloudy)	16,8	30,5	44,4	58,3	12,0	25,6	11.20.39,2		B.
	Mars 1 L.... (very cloudy)	....	....	....	27,1	40,9	54,3	12.36. 8,0	- 20,34	B.
	Jupiter 1 L.} .....	30,8	....	57,7	....	24,8	....	12.42.52,0	+ 0,07	B.
	Jupiter 2 L.} .....	....	47,1	....	14,0	....	41,4	12.42. ....	- 0,09	B.
	Spica.....	44,0	57,9	11,7	25,6	39,2	52,9	13.17. 6,8		B.
	(g) δ Ophiuchi.....	57,8	11,5	24,7	38,5	52,1	5,3	16. 6.18,7		B.
	Saturn 1 L.....	59,8	....	28,1	....	57,1	....	16.10.26,0	+ 0,07	B.
	Saturn 2 L.....	....	17,5	....	46,1	....	14,8	16.10. ....	- 0,09	B.
	(g) Antares .....	31,1	46,3	1,2	16,3	31,2	46,3	16.20. 1,4		B.
	29 Scorpii.....	11,1	26,9	41,8	56,7	11,9	27,0	17. 4.41,9		B.
	α Ophiuchi..	29,4	43,4	57,2	11,1	24,9	38,7	17.27.52,3		B.
	* N.P.D. 48°. 12'.....	56,0	14,8	32,3	50,9	9,1	26,8	17.46.44,9		B.
July 16	9 Sagittarii.....	59,8	14,8	29,1	44,2	59,0	13,9	17.54.28,3		B.
	A.S.C. 2151.....	....	....	0,1	14,2	28,1	42,2	18.28.56,9	- 14,13	B.
	(h) ☉ 2 L.....	15,6	30,4	44,3	59,5	13,6	....	7.41. ....	+ 14,53	C.
	Antares .....	30,1	45,6	0,0	15,4	30,4	45,3	16.20. 0,5		G.
	α Herculis.....	18,5	32,8	46,7	0,7	14,3	28,2	17. 7.42,2		G.
	α Aquilæ.....	57,1	10,3	24,0	38,0	51,7	5,0	19.43.18,5		G.
July 17	β Aquilæ.....	25,8	39,1	52,3	6,5	20,0	33,8	19.47.47,0		G.
	☉ 1 L.....	1,0	15,9	30,0	44,4	59,1	13,7	7.43.28,1		B.
July 18	☉ 2 L.....	17,0	32,0	46,0	0,9	15,2	29,4	7.45.44,0		B.
	(i) ☾ 1 L.....	45,7	59,9	14,0	28,3	42,8	57,0	13.33.11,0		B.
	(k) Arcturus.....	14,7	29,0	43,1	57,7	12,1	26,3	14. 8.40,7		B.
	δ Ophiuchi.....	53,2	7,1	20,4	34,1	47,4	1,0	16. 6.14,3		B.
	Saturn 1 L.....	30,0	....	58,9	....	27,1	....	16. 9.55,9	+ 0,07	B.
	Saturn 2 L.....	....	47,6	....	16,1	....	44,7	16. 9. ....	- 0,09	B.
	Antares..... (blazing)	27,2	42,5	57,1	12,4	27,4	42,2	16.19.57,2		B.
	* N.P.D. 57°. 11'.....	31,8	48,1	3,7	19,9	36,2	51,9	17.19. 8,1		B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, *ABCDEFGG*.After the observation of Procyon, July 11, the clock was put forward 1<sup>m</sup>.The Transit levelled July 18, 6<sup>h</sup>.

(a) Cloudy, and the wind loud. (b) Very cloudy and unsteady. (c) Disturbed. (d) Very faint.  
 (e) Unsteady. The Sun was shining on the observer's face. (f) Cloudy and dancing. (g) Extra-  
 ordinary difference between the clock errors of these two stars. (h) Cloudy and doubtful. Partly without  
 dark glass. (i) Cloudy, unsteady, and very loud wind. (k) Wind moving the telescope.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>''</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
7.17.30,77 7.19.47,67 7.29.39,46 10.22.34,69 12.27.41,14 12.40.47,40 12.40.40,58 13.16.31,24 14.8.7,40		-0,81	39,31 39,51 34,75 41,17 48,52 31,25 7,48	52,80	73,29	1,43	73,11	7.19.52,86 7.30.53,07 10.22.48,48 12.27.55,02 12.41.2,38 13.16.45,15 14.8.21,43	☉'s center. Procyon. Venus 1 L. Mars 1 L. Jupiter's center. Spica. Arcturus.
17.27.15,03 17.52.39,15 5.6.32,58 5.15.51,58			15,09 39,35 32,59 51,68	30,78	15,69	1,42	14,66	17.27.30,78 17.52.55,07 5.6.48,92 5.16.8,03	$\alpha$ Ophiuchi. $\gamma$ Draconis. Rigel. $\beta$ Tauri.
7.26.37,13 7.28.53,86 8.41.2,80 9.59.31,87 10.30.13,84 12.41.28,52 12.41.30,84			45,59 2,88 31,93 13,89 29,71	48,56	16,63	1,34	16,05	7.28.2,06 8.41.19,41 9.59.48,54 10.30.30,53 12.41.46,47	☉'s center. Mercury 1 L. Regulus. Venus 1 L. Jupiter's center.
7.30.33,29 7.34.41,34 7.36.58,00 8.55.9,39 10.37.45,95 11.19.58,12 12.35.27,23 12.42.11,39 12.42.14,08 13.16.25,44 16.5.38,37 16.9.42,82 16.9.46,04 16.19.16,26 17.3.56,76 17.27.11,00 17.45.50,68 17.53.44,15 18.28.14,17			33,34 49,76 9,47 46,00 58,16 27,25 12,77 25,45 38,43 44,42 16,23 56,73 11,06 50,84 44,12 14,17	52,84	19,50	1,26	18,84	7.30.52,57 7.36.9,00 8.55.28,78 10.38.5,40 11.20.17,59 12.35.46,75 12.42.32,28 13.16.44,99 16.5.58,11 16.10.4,11 16.19.35,92 17.4.16,47 17.27.30,82 17.46.10,61 17.54.3,90 18.28.33,98	Procyon. ☉'s center. Mercury 1 L. Venus 1 L. J 1 L. Mars 1 L. Jupiter's center. Spica. $\delta$ Ophiuchi. Saturn's center. Antares. 29 Scorpii. $\alpha$ Ophiuchi. * N.P.D. 48°.12'. 9 Sagittarii. A.S.C. 2151.
7.40.59,21 16.19.15,33 17.7.0,48 19.42.37,80 19.47.6,36			59,33 15,31 0,59 37,88 6,44	36,15	20,84	1,23	19,98	7.41.19,70 16.19.36,13 17.7.21,45 19.42.58,87 19.47.27,43	☉ 2 L. Antares. $\alpha$ Herculis. $\alpha$ Aquilæ. $\beta$ Aquilæ.
7.42.44,60 7.45.0,64			52,74			1,36	21,33	7.44.14,51	☉'s center.
13.32.28,39 14.7.57,66 16.5.33,93 16.9.13,04 16.9.16,04 16.19.12,28 17.18.19,96		-0,25	28,44 57,80 34,05 14,58 12,30 20,13	21,39 57,58	23,59 23,53		22,69	13.32.51,89 14.8.21,29 16.5.57,65 16.9.38,19 16.19.35,91 17.18.43,80	J 1 L. Arcturus. $\delta$ Ophiuchi. Saturn's center. Antares. * N.P.D. 57°.11'.

Error of Collimation = -0'',01.

Level Error = +1'',88. From July 16 = +2'',45.

Meridian Error from July 18 by Polaris SP and  $\alpha$  Aquilæ July 25, allowing +0'',37 for loss of clock.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
July 18	(a) * N.P.D. 55°. 3'.....	.....	13,2	29,1	.....	2,8	19,2	17. 26. 35,5	- 9,89	B.
	(a) * N.P.D. 48°. 12'.....	.....	.....	28,1	46,9	5,1	22,9	17. 46. 41,1	- 18,06	B.
	γ Draconis..... (cloud)	.....	48,1	9,3	31,2	53,1	14,4	17. 53. 36,1	- 10,88	B.
	* N.P.D. 44°. 18'.....	10,9	30,6	49,1	9,1	28,0	47,8	18. 1. 7,1		B.
	(b) * N.P.D. 38°. 21'.....	.....	42,1	4,2	25,9	47,2	9,1	18. 31. 30,8	- 10,90	B.
	α Aquilæ.....	54,1	8,1	21,3	35,1	48,7	2,2	19. 43. 16,0		B.
	β Aquilæ.....	22,8	36,9	50,0	3,8	17,2	30,9	19. 47. 44,1		B.
July 20	δ 1 L..... (faint and hazy)	6,9	21,9	37,0	52,0	7,2	22,1	15. 8. 37,1		B.
	δ Ophiuchi..... (faint)	51,1	4,5	17,9	31,4	44,7	58,4	16. 5. ....	+ 6,76	B.
	(c) Saturn 1 L.....	12,1	.....	40,9	.....	9,0	.....	16. 9. 38,1	+ 0,07	B.
	Saturn 2 L.....	.....	29,4	.....	58,1	.....	26,7	16. 9. ....	- 0,09	B.
	Antares.....	24,4	39,6	54,4	9,7	24,8	39,8	16. 19. 55,1		B.
	* N.P.D. 44°. 18'.....	8,2	27,9	46,6	6,4	25,9	45,1	18. 1. 4,1		B.
	* N.P.D. 87°. 44'.....	16,4	29,7	42,9	56,1	9,8	23,2	18. 48. 37,1		B.
	α Aquilæ.....	51,5	5,2	18,3	32,1	46,2	59,4	19. 43. 13,2		B.
	β Aquilæ.....	20,0	33,8	47,1	1,2	14,8	28,3	19. 47. 41,4		B.
July 21	(d) δ 1 L.....	35,3	51,1	6,3	22,0	37,4	53,0	16. 1. 8,4		B.
	Antares.....	23,0	38,2	53,1	8,4	23,6	38,2	16. 19. 53,2		B.
	α Aquilæ.....	49,2	3,2	17,2	30,9	44,3	58,1	19. 43. 12,1		B.
	β Aquilæ.....	19,1	32,4	45,9	59,8	13,0	26,9	19. 47. 40,3		B.
	(a) α² Capricorni.....	1,1	15,2	28,9	43,1	56,7	10,5	20. 9. 24,1		B.
July 22	⊙ 1 L.....	58,1	12,7	27,0	41,6	56,0	10,5	8. 3. 24,8		B.
	⊙ 2 L.....	13,5	28,1	42,2	57,1	11,7	25,4	8. 5. 40,0		B.
	δ Ophiuchi.....	48,1	1,9	15,2	28,5	42,2	55,8	16. 6. 9,2		B.
	(a) Saturn 1 L.....	55,2	.....	23,9	.....	52,3	.....	16. 9. 21,0	+ 0,07	B.
	Saturn 2 L.....	.....	12,7	.....	41,4	.....	10,0	16. 9. ....	- 0,09	B.
	(e) Antares.....	21,7	37,0	51,5	7,2	22,2	37,1	16. 19. 52,1		B.
	(e) τ Scorpii.....	40,9	56,1	11,2	26,7	42,1	57,1	16. 26. 12,1		B.
	(f) δ 1 L.....	33,2	49,2	4,9	20,9	36,5	52,3	16. 57. 8,1		B.
	α Herculis.....	10,2	24,7	38,1	52,1	6,2	20,0	17. 7. 34,1		B.
	(a) θ Ophiuchi.....	57,3	.....	27,2	42,2	57,2	11,8	17. 12. 27,1	- 4,93	B.
	α Ophiuchi.....	20,1	34,0	47,7	1,6	15,3	29,1	17. 27. 43,1		B.
	p Sagittarii.....	14,9	30,2	45,1	0,8	16,1	31,1	17. 37. 46,0		B.
	γ Draconis.....	20,6	42,9	4,1	26,1	47,4	9,2	17. 53. 31,1		B.
	α Aquilæ.....	49,0	2,4	16,4	30,1	43,2	57,0	19. 43. 11,0		B.
	β Aquilæ.....	17,9	31,6	45,1	58,5	12,2	25,1	19. 47. 39,0		B.
	(a) α² Capricorni.....	.....	14,2	27,4	42,0	55,3	9,1	20. 9. 23,0	- 6,95	B.
July 24	⊙ 1 L.....	53,4	8,0	22,2	36,8	50,9	5,3	8. 11. 19,4		B.
	⊙ 2 L.....	8,3	22,8	37,0	51,5	5,8	20,2	8. 13. 34,4		B.
	(g) Saturn 1 L.....	.....	54,6	.....	23,3	.....	52,0	16. 8. ....	- 0,09	B.
	Saturn 2 L.....	.....	.....	12,2	.....	40,9	.....	16. 9. 9,2	- 14,24	B.
	Antares.....	19,9	35,2	49,1	4,5	19,9	34,5	16. 19. 49,7		B.
	α Herculis.....	8,7	22,2	35,7	50,0	4,1	18,0	17. 7. 31,7		B.
July 25	Jupiter 1 L. } (very faint)	36,8	.....	3,9	.....	31,2	.....	12. 46. 57,9	+ 0,07	B.
	Jupiter 2 L. }	.....	53,2	.....	20,2	.....	47,2	12. 46. ....	- 0,09	B.
	Polaris SP.....	.....	44.48,8	53. 9,5	1.22,7	.....	.....	13. ....	+ 8. 21,54	B.
	(a) α Aquilæ.....	45,1	.....	.....	26,1	39,7	53,1	19. 43. 6,9	- 8,18	B.
July 26	⊙ 1 L.....	.....	.....	14,8	29,4	43,6	58,0	8. 19. 12,3	- 14,34	B.
	⊙ 2 L.....	1,1	15,2	29,1	43,9	58,1	12,5	8. 21. 27,0		B.
July 27	(h) ⊙ 1 L.....	41,8	56,1	10,0	24,7	39,1	53,2	8. 23. 7,7		B.
	⊙ 2 L.....	56,2	10,5	24,4	39,1	53,6	8,0	8. 25. 22,0		B.
July 31	(i) ⊙ 1 L.....	.....	32,2	46,4	1,0	15,2	29,1	8. 38. 43,3	- 7,09	B.
	(k) Castor.....	.....	.....	23,2	.....	55,3	11,7	7. 24. 27,2	- 19,85	B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, *ABCDEFGH*.  
Transit levelled July 25, 2<sup>h</sup><sub>4</sub>, and Aug. 1, 2<sup>h</sup><sub>4</sub>.

- (a) Cloudy.  
(b) Very faint.  
(c) Faint and unsteady.  
(d) Faint and uneven.  
(e) Disturbed.

- (f) Limb ragged and unsteady.  
(g) Cloudy and very faint.  
(h) Sufficiently steady.  
(i) Very cloudy and doubtful.  
(k) Cloudy and very unsteady.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>''</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
17.25.46,07		- 0,25	46,25			1,36	22,69	17.26.9,93	* N.P.D. 55°. 3'.
17.45.46,76			46,98					17.46.10,68	* N.P.D. 48°. 12'.
17.52.31,15			31,41					17.52.55,11	γ Draconis.
18.0.8,95			9,18					18.0.32,89	* N.P.D. 44°. 18'.
18.30.25,65			25,91					18.30.49,65	* N.P.D. 38°. 21'.
19.42.35,07			35,18	58,85	23,67			19.42.58,99	α Aquilæ.
19.47.3,67			3,78	27,50	23,72			19.47.27,59	β Aquilæ.
15.7.52,03			52,05			1,40	25,30	15.8.18,23	♃ 1 L.
16.5.31,43			31,55	57,57	26,02			16.5.57,79	♃ Ophiuchi.
16.8.55,09			56,57					16.9.22,81	Saturn's center.
16.8.57,98								16.19.35,96	Antares.
16.19.9,69			9,71	36,13	26,42			18.0.32,89	* N.P.D. 44°. 18'.
18.0.6,31			6,54					18.48.22,96	* N.P.D. 87°. 44'.
18.47.56,46			56,56					19.42.58,83	α Aquilæ.
19.42.32,27			32,38	58,87	26,49			19.47.27,51	β Aquilæ.
19.47.0,94			1,05	27,52	26,47				
16.0.21,93			21,94			1,36	26,79	16.0.49,64	♃ 1 L.
16.19.8,25			8,27	36,12	27,85			16.19.35,97	Antares.
19.42.30,71			30,82	58,88	28,06			19.42.58,73	α Aquilæ.
19.46.59,63			59,74	27,53	27,79			19.47.27,65	β Aquilæ.
20.8.42,80			42,85	10,64	27,79			20.9.10,78	α² Capricorni.
8.2.41,53			49,34			1,17	28,10	8.4.17,83	☉'s center.
8.4.56,86								16.5.57,70	♃ Ophiuchi.
16.5.28,70			28,82	57,55	28,73			16.9.8,64	Saturn's center.
16.8.38,17			39,76					16.19.35,88	Antares.
16.8.41,28								16.25.55,51	τ Scorpii.
16.19.6,97			6,99	36,11	29,12			16.56.49,65	♃ 1 L.
16.25.26,60			26,61					17.7.21,26	α Herculis.
16.56.20,72			20,73					17.12.11,16	θ Ophiuchi.
17.6.52,20			52,33	21,43	29,10			17.27.30,62	α Ophiuchi.
17.11.42,20			42,22					17.37.29,57	p Sagittarii.
17.27.1,55			1,67	30,75	29,08			17.52.55,15	γ Draconis.
17.37.0,60			0,61					19.42.59,10	α Aquilæ.
17.52.25,92			26,18					19.47.27,66	β Aquilæ.
19.42.29,93			30,04	58,88	28,84			20.9.10,68	α² Capricorni.
19.46.58,49			58,60	27,53	28,93				
20.8.41,55			41,60	10,65	29,05				
8.10.36,57			44,12			1,27	30,44	8.12.14,99	☉'s center.
8.12.51,43								16.8.56,19	Saturn's center.
16.8.23,21			24,90					16.19.35,99	Antares.
16.8.26,53								17.7.21,50	α Herculis.
16.19.4,68			4,69	36,10	31,41				
17.6.50,05			50,16	21,41	31,25				
12.46.17,52		24,32	18,89			1,30	31,75	12.46.51,33	Jupiter's center.
12.46.20,11								1.1.56,38	Polaris SP.
13.1.28,54				56,36	32,43			19.42.58,91	α Aquilæ.
19.42.26,00	26,10			58,91	32,82				
8.18.29,28			36,68				33,05	8.20.10,18	☉'s center.
8.20.43,84									
8.22.24,66									
8.24.39,12			32,01			1,22	34,27	8.24.6,71	☉'s center.
8.38.0,78		- 0,60	0,82			1,32	38,95	8.38.40,24	☉ 1 L.
7.23.39,50			39,56	20,27	40,71			7.24.20,24	Castor.

Error of Collimation = -0",01. From July 31, = -0",73. See Introduction.

Level Error = +2",45. From July 24 = +2",12. From July 31, = +1",93.

Meridian Error from July 31 by two sets of three consecutive Transits of δ Ursæ Minoris Aug. 1 and 2, which gave respectively -0",59 and -0",60.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Aug. 1	(a) Mercury 1 L.....	41,8	.....	9,0	22,7	36,2	49,8	10.28.33	-4,54	B.
	(a) Venus 1 L.....	2,9	16,2	29,8	.....	56,5	10,1	11.37.23,5	+0,01	B.
	Jupiter 1 L. }..... (faint)	56,6	.....	23,8	.....	51,2	.....	12.50.18,0	+0,03	B.
	Jupiter 2 L. }	.....	13,2	.....	40,1	.....	7,2	12.50. ....	-0,04	B.
	Polaris SP.....	36.26,4	.....	53.5,3	1.20,8	9.49,4	17.56,4	13.26.16,2	-2.46,09	B.
	(b) Mars 1 L.....	.....	.....	23,3	37,0	50,6	4,1	13.11.17,7	-13,58	B.
	Spica.....	23,1	36,6	50,1	4,1	17,8	31,0	13.16.44,9		B.
	δ Ophiuchi.....	36,1	49,4	2,8	16,6	29,9	43,3	16.5.56,9		B.
	Antares.....	10,0	24,4	39,4	54,8	9,9	24,9	16.19.39,8		B.
	α Herculis.....	58,4	12,8	26,1	40,0	54,0	7,9	17.7.22,1		B.
	* N.P.D. 55°. 3'.....	39,2	55,9	12,1	28,4	45,1	1,6	17.26.18,1		B.
	γ Sagittarii.....	38,3	53,1	7,9	23,0	37,3	52,2	17.54.7,1		B.
	* N.P.D. 44°. 18'.....	54,1	12,9	31,9	51,2	10,9	29,8	18.0.49,1		B.
	δ Ursæ Minoris.....	12.18,4	16.6,8	19.48,5	23.38,4	27.24,3	31.10,6	18.34.57,2		B.
	β Aquilæ.....	5,7	19,1	32,3	46,2	59,8	13,1	19.47.26,7		B.
	α² Capricorni.....	48,1	2,2	15,3	29,2	43,2	57,1	20.9.11,1		B.
	(c) δ Ursæ Minoris SP.....	.....	.....	19.53,4	23.38,7	27.28,8	31.13,3	6.34.56,5	-3.46,50	B.
	Castor.....	50,5	6,5	22,0	38,3	54,0	10,1	7.24.25,9		B.
	Procyon.....	.....	.....	57,8	11,2	24,3	38,1	7.30.51,7	-13,50	B.
	Pollux.....	0,6	15,8	30,8	46,4	1,8	17,1	7.35.32,2		B.
Aug. 2	⊙ 1 L.....	2,9	17,1	30,8	45,2	59,3	13,4	8.46.27,8		B.
	⊙ 2 L.....	16,1	30,3	44,2	58,8	13,2	27,1	8.48.41,3		B.
	Regulus.....	34,9	49,0	52,7	6,5	20,4	34,5	9.59.48,0		B.
	Mercury 1 L.....	38,2	52,0	5,4	19,1	32,7	46,3	10.31.59,9		B.
	Venus 1 L.....	12,8	26,1	39,3	53,1	6,9	20,2	11.40.33,4		B.
	Jupiter 1 L.....	27,2	.....	54,0	.....	21,2	.....	12.50.48,3	+0,03	B.
	Jupiter 2 L.....	.....	48,3	.....	10,1	.....	37,2	12.50. ....	-0,04	B.
	Polaris SP.....	36.27,7	44.46,3	53.4,6	1.20,4	9.47,5	17.57,2	13.26.14,7		B.
	Mars 1 L.....	6,2	19,8	33,3	47,0	0,8	14,2	13.13.27,9		B.
	Spica.....	21,5	35,1	48,6	2,7	16,2	30,0	13.16.43,4		B.
	(d) Saturn 1 L.....	52,3	.....	20,5	.....	49,1	.....	16.8.17,8	+0,03	B.
	Saturn 2 L.....	.....	9,4	.....	38,2	.....	6,5	16.8. ....	-0,04	B.
	Antares.....	8,4	23,4	38,0	53,5	8,3	23,4	16.19.38,2		B.
	α Herculis.....	57,0	11,1	24,4	39,0	52,6	6,9	17.7.20,3		B.
	* N.P.D. 55°. 3'.....	38,0	54,5	11,0	27,2	43,9	59,7	17.26.16,9		B.
	δ Ursæ Minoris.....	12.17,8	16.4,5	19.46,3	23.36,7	27.22,3	31.9,2	18.34.55,3		B.
	α Aquilæ.....	35,4	49,2	2,9	16,2	29,9	43,9	19.42.57,2		B.
	β Aquilæ.....	4,4	18,1	31,2	45,1	58,3	12,0	19.47.25,3		B.
	α² Capricorni.....	47,1	0,5	14,0	28,1	41,9	55,7	20.9.9,8		B.
	γ 2 L.....	54,2	9,3	24,0	39,2	54,1	9,2	3.12.24,2		B.
	η Tauri.....	30,2	44,9	59,2	14,2	29,0	43,7	3.37.58,1		B.
	Α¹ Tauri.....	46,7	1,0	15,0	30,0	44,2	58,9	3.55.13,1		B.
	β Tauri.....	39,5	54,8	9,8	25,6	40,8	55,9	5.16.11,3		B.
	δ Ursæ Minoris SP.....	.....	16.4,7	19.49,5	23.37,2	27.27,4	31.11,6	6.34.56,7	-1.53,24	B.
	Castor.....	.....	.....	20,9	37,0	52,8	8,9	7.24.24,7	-15,89	B.
	Procyon.....	29,1	42,6	55,9	9,8	23,1	36,6	7.30.50,3		B.
	Pollux.....	58,9	14,3	29,5	45,0	0,2	15,5	7.35.31,0		B.
Aug. 3	⊙ 1 L.....	54,0	8,0	21,8	36,5	50,3	4,8	8.50.18,3		B.
	⊙ 2 L.....	7,3	21,3	35,2	49,3	3,6	18,2	8.52.32,1		B.
	Venus 1 L.....	20,3	33,7	47,2	0,6	14,3	27,8	11.43.41,2		B.
	(e) Jupiter 1 L.....	57,9	.....	24,9	.....	51,7	.....	12.51.19,2	+0,03	B.
	Jupiter 2 L.....	.....	14,2	.....	41,3	.....	7,7	12.51. ....	-0,04	B.
	(f) Mars 1 L.....	.....	.....	.....	58,1	11,9	25,3	13.15.39,1	-20,45	B.
	α Aquilæ.....	34,1	47,7	1,1	15,2	28,4	42,1	19.42.55,6		B.
	β Aquilæ.....	3,2	16,4	29,9	43,5	57,1	10,4	19.47.23,9		B.
	α² Capricorni.....	45,2	59,1	12,8	27,1	40,8	54,2	20.9.8,0		B.
Aug. 4	Rigel.....	22,8	36,1	49,4	3,8	17,4	30,8	5.6.44,4		B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, *ABCDEFGH*.

(a) Cloudy and very unsteady.  
 (b) Tremulous.  
 (c) Extremely faint.

(d) Very hazy and faint.  
 (e) Very faint.  
 (f) Cloudy and very faint.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>''</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
10. 27. 22,59		- 0,60	22,60			1,32	40,27	10. 28. 3,45	Mercury 1 L.
11. 36. 43,18			43,18					11. 37. 24,09	Venus 1 L.
12. 49. 37,43			38,77					12. 50. 19,74	Jupiter's center.
12. 49. 40,13								1. 2. 0,95	Polaris SP.
13. 1. 22,99			19,97	1,24	41,27			13. 11. 17,93	Mars 1 L.
13. 10. 36,96			36,94					13. 16. 44,91	Spica.
13. 16. 3,94			3,91	44,89	40,98			16. 5. 57,60	δ Ophiuchi.
16. 5. 16,43			16,45	57,47	41,02			16. 19. 35,85	Antares.
16. 18. 54,74			54,68	36,03	41,35			17. 7. 21,42	α Herculis.
17. 6. 40,18			40,21	21,35	41,14			17. 26. 9,94	* N.P.D. 55°. 3'.
17. 25. 28,63			28,71					17. 54. 3,90	9 Sagittarii.
17. 53. 22,70			22,64					18. 0. 32,77	* N.P.D. 44°. 18'.
17. 59. 51,41			51,51					18. 24. 20,46	δ Ursæ Minoris.
18. 23. 37,74	38,80		39,18	19,92	40,74			19. 47. 27,50	β Aquilæ.
19. 46. 46,13			46,14	27,60	41,46			20. 9. 10,81	α² Capricorni.
20. 8. 29,46			29,43	10,74	41,31	1,34	41,58	18. 24. 20,24	δ Ursæ Min. SP.
6. 23. 39,64	38,74		38,30	19,78	41,48			7. 24. 20,24	Castor.
7. 23. 38,19			38,25	20,30	42,05			7. 30. 53,13	Procyon.
7. 30. 11,12			11,13	53,11	41,98			7. 35. 28,45	Pollux.
7. 34. 46,39			46,45	28,47	42,02				
8. 45. 45,21			52,01					8. 47. 34,08	☉'s center.
8. 47. 58,72								9. 59. 48,73	Regulus.
9. 59. 6,57			6,59	48,58	41,99			10. 32. 1,27	Mercury 1 L.
10. 31. 19,09			19,10					11. 40. 35,34	Venus 1 L.
11. 39. 53,11			53,11					12. 50. 51,21	Jupiter's center.
12. 50. 7,70			8,92					1. 2. 1,92	Polaris SP.
12. 50. 10,16								13. 13. 29,33	Mars 1 L.
13. 1. 22,63			19,61	2,06	42,45			13. 16. 44,79	Spica.
13. 12. 47,03			47,01					16. 8. 18,90	Saturn's center.
13. 16. 2,50			2,47	44,88	42,41			16. 19. 35,74	Antares.
16. 7. 34,95			36,42					17. 7. 21,32	α Herculis.
16. 7. 37,99								17. 26. 9,95	* N.P.D. 55°. 3'.
16. 18. 53,31			53,25	36,02	42,77			18. 24. 20,06	δ Ursæ Minoris.
17. 6. 38,76			38,79	21,34	42,55			19. 42. 59,08	α Aquilæ.
17. 25. 27,32			27,40					19. 47. 27,61	β Aquilæ.
18. 23. 36,01	37,07		37,45	19,65	42,20			20. 9. 10,84	α² Capricorni.
19. 42. 16,39			16,40	58,95	42,55	1,39	42,95	3. 12. 22,36	☽ 2 L.
19. 46. 44,91			44,92	27,60	42,68			3. 37. 57,40	η Tauri.
20. 8. 28,16			28,13	10,75	42,62			3. 55. 13,07	α¹ Tauri.
3. 11. 39,17			39,22					5. 16. 8,70	β Tauri.
3. 37. 14,18			14,24					18. 24. 19,92	δ Ursæ Min. SP.
3. 54. 29,84			29,89					7. 24. 20,41	Castor.
5. 15. 25,39			25,44	8,67	43,23			7. 30. 53,02	Procyon.
6. 23. 37,94	37,04		36,60	19,51	42,91			7. 35. 28,36	Pollux.
7. 23. 36,97			37,03	20,32	43,29				
7. 30. 9,63			9,64	53,12	43,48				
7. 34. 44,91			44,97	28,49	43,52				
8. 49. 36,24			42,95					8. 51. 26,41	☉'s center.
8. 51. 49,58								11. 43. 44,36	Venus 1 L.
11. 43. 0,73			0,73					12. 51. 23,42	Jupiter's center.
12. 50. 38,45			39,73					13. 15. 41,85	Mars 1 L.
12. 50. 41,03								19. 42. 58,99	α Aquilæ.
13. 14. 58,15			58,13					19. 47. 27,59	β Aquilæ.
19. 42. 14,89			14,90	58,95	44,05			20. 9. 10,83	α² Capricorni.
19. 46. 43,48			43,49	27,60	44,11				
20. 8. 26,74			26,71	10,75	44,04				
5. 6. 3,53			3,50	49,45	45,95	1,37	45,70	5. 6. 49,49	Rigel.

Error of Collimation = -0'',73.

Level Error = +1'',93.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Aug. 4	$\beta$ Tauri.....	36,9	52,0	7,2	22,9	38,1	53,4	5.16. 8,8		B.
	$\gamma$ 2 L.....	46,9	2,1	17,4	33,9	49,4	5,0	5.20.21,0		B.
	$\delta$ Ursæ Minoris SP...	12.16,4	16. 1,7	....	23.33,5	27.23,8	31. 8,6	6.34.51,7	- 0.37,75	B.
	Castor.....	46,5	2,8	18,0	34,2	50,1	6,0	7.24.21,9		B.
	Procyon.....	26,3	39,9	53,2	6,9	20,4	34,1	7.30.47,5		B.
	Pollux.....	56,7	12,0	26,8	42,1	57,3	12,9	7.35.28,0		B.
Aug. 5	$\odot$ 1 L.....	34,8	49,1	2,7	17,2	31,3	45,3	8.57.59,4		B.
	$\odot$ 2 L.....	48,0	2,2	15,9	30,2	44,1	58,2	9. 0.12,2		B.
	Mercury 1 L.....	25,6	39,3	52,6	6,4	19,9	33,5	10.42.47,1		B.
	(a) Venus 1 L.....	29,5	42,9	56,4	9,8	23,5	37,0	11.49.50,3		B.
	Spica.....	17,3	31,1	44,4	58,3	12,1	25,8	13.16.39,4		B.
	$\alpha$ Aquilæ.....	31,3	45,1	58,2	12,2	26,2	39,3	19.42.53,1		B.
	$\beta$ Aquilæ.....	0,2	13,8	27,1	40,8	54,2	8,0	19.47.21,2		B.
	$\alpha^2$ Capricorni.....	42,8	56,4	10,1	23,9	37,8	51,8	20. 9. 5,5		B.
	* N.P.D. 26°.38'.....	....	25,3	54,7	24,8	54,3	24,9	20.24.53,8	- 14,96	B.
	(b) * N.P.D. 60°.26'.....	36,1	51,7	7,1	22,5	38,3	53,4	21. 1. 9,2		B.
	* N.P.D. 76°.43'.....	49,5	3,7	17,1	30,9	44,8	58,5	21. 9.12,9		B.
	$\delta$ Ursæ Minoris SP...	12.14,8	16. 1,6	....	....	....	31. 6,7	6.34.49,5	- 0,66	B.
	(c) $\gamma$ 2 L.....	39,1	54,9	10,1	26,1	41,8	57,3	6.26.13,2		B.
	$\odot$ 1 L.....	24,4	38,5	52,2	6,6	20,9	34,8	9. 1.48,6		B.
	$\odot$ 2 L.....	37,1	51,1	5,1	19,4	33,4	47,4	9. 4. 1,8		B.
	$\delta$ Ursæ Minoris.....	....	....	19.40,6	23.30,8	27.15,7	31. 2,2	18.34.49,3	- 3.45,99	B.
	(d) $\beta$ Aquilæ.....	....	....	26,4	39,9	53,2	7,1	19.47.20,3	- 13,50	B.
Aug. 7	(e) Venus 1 L.....	29,4	42,9	56,0	9,9	23,2	36,9	11.55.50,2		B.
	$\alpha$ Herculis.....	50,3	4,2	18,1	32,0	45,7	59,9	17. 7.14,1		B.
	$\delta$ Ursæ Minoris.....	....	....	....	23.29,8	27.16,0	31. 2,2	18.34.48,7	- 5.39,98	B.
	$\alpha$ Aquilæ.....	28,9	42,9	56,2	10,0	23,3	37,1	19.42.50,7		B.
	$\beta$ Aquilæ.....	58,0	11,7	25,0	38,4	52,0	5,4	19.47.19,0		B.
	$\alpha^2$ Capricorni.....	40,1	54,0	7,6	21,6	35,3	49,2	20. 9. 3,1		B.
Aug. 8	(f) Saturn 1 L.....	37,2	....	5,8	....	34,3	....	16. 8. 3,0	+ 0,03	B.
	Saturn 2 L.....	....	54,6	....	23,2	....	51,4	16. 7. ....	- 0,04	B.
	Antares.....	1,1	15,3	30,3	45,5	0,8	15,6	16.19.30,5		B.
	$\alpha$ Herculis.....	49,2	3,1	17,1	31,1	45,0	59,0	17. 7.12,7		B.
	$\alpha$ Ophiuchi.....	59,1	12,9	26,2	40,3	54,1	8,1	17.27.21,6		B.
	(g) * N.P.D. 48°.16'.....	....	6,2	24,7	43,1	1,2	....	17.46. ....	+ 9,06	B.
	9 Sagittarii.....	29,2	44,0	59,1	13,7	28,3	43,2	17.53.58,3		B.
	$\delta$ Ursæ Minoris.....	....	15.54,8	19.38,2	23.27,7	27.13,5	31. 1,4	18.34.48,2	- 1.53,00	B.
	64 Serpentis.....	43,3	56,7	10,3	24,0	37,3	50,7	18.49. 4,1		B.
	$\alpha$ Aquilæ.....	27,9	41,3	54,8	8,6	22,2	35,6	19.42.49,3		B.
	$\beta$ Aquilæ.....	56,6	10,1	23,2	37,0	50,7	4,2	19.47.18,0		B.
	$\alpha^2$ Capricorni.....	39,0	52,7	6,2	20,3	34,1	48,2	20. 9. 1,7		B.
	(h) * N.P.D. 26°.38'.....	50,0	20,2	49,9	20,4	50,1	20,7	20.24.51,2		B.
	* N.P.D. 60°.26'.....	15,9	31,2	46,1	2,1	17,3	32,9	21. 1.48,1		B.
	* N.P.D. 76°.43'.....	56,3	0,1	13,3	27,5	41,2	55,0	21. 9. 9,0		B.
	(i) * N.P.D. 75°.23'.....	....	....	2,0	16,1	30,0	44,0	21.19.58,1	- 13,88	B.
	$\delta$ Ursæ Minoris SP...	....	....	19.37,8	23.26,6	27.15,7	30.58,4	6.34.45,2	- 3.46,53	B.
	Pollux.....	51,9	7,1	22,2	37,5	53,1	8,2	7.35.23,4		B.
Aug. 9	(k) Mercury 1 L.....	12,0	25,3	38,8	....	....	....	10.53. ....	+ 27,07	B.
	$\beta$ Leonis.....	19,2	33,0	46,6	0,8	14,7	28,6	11.40.42,4		B.
	(l) Venus 1 L.....	20,0	33,3	46,4	0,1	13,5	27,0	12. 1.40,8		B.
Aug. 10	$\beta$ Leonis.....	17,5	31,2	45,1	59,2	13,1	27,0	11.40.41,0		B.
	(m) Venus 1 L.....	11,0	24,4	37,9	51,5	5,0	18,4	12. 4.32,0		B.
	Mars 1 L..... (cloudy)	....	....	20,4	34,3	48,1	2,0	13.31.15,6	- 13,66	B.
	Antares.....	58,1	13,2	27,9	43,1	58,1	13,1	16.19.28,0		B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, *ABCDEFGH*.  
Transit levelled Aug. 7, 2 $\frac{1}{2}$ <sup>h</sup> and Aug. 12, 2<sup>h</sup>.

(a) The observation has been diminished 5". (b) Mistaken for a star observed on Aug. 8; it is supposed to be of nearly the same N.P.D. (c) Very cloudy and faint. (d) Not used for clock error. (e) Wire I was written down 39,4. (f) Faint. (g) Cloudy and very faint, a star of the 9<sup>th</sup> or 10<sup>th</sup> magnitude, not observed before. (h) The observation is probably 1" in defect. (i) The  $R$  of this star in p. 111 of the Vol. for 1836 is about 10" in defect. (k) Cloudy and very unsteady. (l) Great motion. (m) Cloudy and very doubtful.

Concluded Transit over the Mean of the seven Wires.			Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>s.</i>	"	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h.</i> <i>m.</i> <i>s.</i>	
5.15.22,75				- 0,60	22,80	8,73	45,93	1,37	45,70	5.16. 8,80	$\beta$ Tauri.
5.19.33,67					33,72					5.20.19,72	$\gamma$ 2 L.
6.23.34,86					33,56	18,89	45,33			18.24.19,62	$\delta$ Ursæ Min. SP.
7.23.34,21					34,27	20,37	46,10			7.24.20,39	Castor.
7.30. 6,90					6,91	53,16	46,25			7.30.53,04	Procyon.
7.34.42,25					42,30	28,53	46,23			7.35.28,43	Pollux.
8.57.17,12					23,66					8.59. 9,87	$\odot$ 's center.
8.59.30,11											
10.42. 6,34					6,35					10.42.52,66	Mercury 1 L.
11.49. 9,92					9,92					11.49.56,29	Venus 1 L.
13.15.58,35					58,32	44,84	46,52			13.16.44,78	Spica.
19.42.12,20					12,21	58,95	46,74			19.42.59,03	$\alpha$ Aquilæ.
19.46.40,75					40,76	27,61	46,85			19.47.27,59	$\beta$ Aquilæ.
20. 8.24,04					24,00	10,77	46,77			20. 9.10,85	$\alpha^2$ Capricorni.
20.23.24,67					24,86					20.24.11,72	* N.P.D. 26°.38'.
21. 0.22,61					22,66					21. 1. 9,56	* N.P.D. 60°.26'.
21. 8.31,05					31,07					21. 9.17,98	* N.P.D. 76°.43'.
6.23.32,49	31,63			- 0,07	31,58	18,55	46,97	1,20	47,07	18.24.18,97	$\delta$ Ursæ Min. SP.
6.25.26,07					26,14					6.26.13,53	$\gamma$ 2 L.
9. 1. 6,57					13,01					9. 3. 0,53	$\odot$ 's center.
9. 3.19,33											
18.23.29,73	30,75				30,79	18,39	47,60			18.24.18,78	$\delta$ Ursæ Minoris.
19.46.39,88					39,92	27,61	47,69			19.47.27,98	$\beta$ Aquilæ.
11.55. 9,79				+ 1,80	9,92			1,24	48,06	11.55.58,60	Venus 1 L.
17. 6.32,04					32,17	21,28	49,11			17. 7.21,11	$\alpha$ Herculis.
18.23.29,20					29,08	18,05	48,97			18.24.18,09	$\delta$ Ursæ Minoris.
19.42. 9,87					9,99	58,96	48,97			19.42.59,07	$\alpha$ Aquilæ.
19.46.38,50					38,63	27,61	48,98			19.47.27,71	$\beta$ Aquilæ.
20. 8.21,55					21,66	10,78	49,12			20. 9.10,76	$\alpha^2$ Capricorni.
16. 7.20,10					21,67			1,23	49,32	16. 8.11,81	Saturn's center.
16. 7.23,03											
16.18.45,59					45,70	35,95	50,25			16.19.35,85	Antares.
17. 6.31,02					31,15	21,27	50,12			17. 7.21,34	$\alpha$ Herculis.
17.26.40,32					40,45	30,63	50,18			17.27.30,66	$\alpha$ Ophiuchi.
17.45.42,86					42,99					17.46.33,22	* N.P.D. 48°.16'.
17.53.13,68					13,79					17.54. 4,02	$\gamma$ Sagittarii.
18.23.27,63	28,65				27,51	17,74	50,23			18.24.17,77	$\delta$ Ursæ Minoris.
18.48.23,77					23,89					18.49.14,17	$\delta$ 4 Serpents.
19.42. 8,53					8,65	58,96	50,31			19.42.58,98	$\alpha$ Aquilæ.
19.46.37,12					37,25	27,62	50,37			19.47.27,58	$\beta$ Aquilæ.
20. 8.20,31					20,42	10,78	50,36			20. 9.10,77	$\alpha^2$ Capricorni.
20.23.20,36					20,48					20.24.10,85	* N.P.D. 26°.38'.
21. 1. 1,94					2,06					21. 1.52,45	* N.P.D. 60°.26'.
21. 8.27,49					27,62					21. 9.18,02	* N.P.D. 76°.43'.
21.19.16,16					16,29					21.20. 6,70	* N.P.D. 75°.23'.
6.23.26,21	25,35				26,68	17,58	50,90	1,16	50,46	18.24.17,45	$\delta$ Ursæ Min. SP.
7.34.37,63					37,75	28,61	50,86			7.35.28,58	Pollux.
10.53.52,44					52,57					10.54.43,55	Mercury 1 L.
11.40. 0,75					0,89	51,89	51,00			11.40.51,91	$\beta$ Leonis.
12. 1. 0,15					0,27					12. 1.51,31	Venus 1 L.
11.39.59,16					59,30	51,89	52,59	1,30	51,79	11.40.51,72	$\beta$ Leonis.
12. 3.51,45					51,58					12. 4.44,02	Venus 1 L.
13.30.34,42					34,54					13.31.27,06	Mars 1 L.
16.18.43,07					43,18	35,93	52,75			16.19.35,85	Antares.

Error of Collimation = - 0'',73.

Level Error from Aug. 4 = + 1'',89. From Aug. 10 = + 2'',01.

Meridian Error from  $\delta$  Ursæ Minoris SP Aug. 5 by  $\delta$  Ursæ Min. SP Aug. 5 and  $\delta$  Ursæ Minoris Aug. 6, allowing + 0'',63 for loss of clock, and + 0'',16 for change of  $\mathcal{R}$ . That from Aug. 7, by  $\delta$  Ursæ Minoris, and  $\delta$  Ursæ Minoris SP Aug. 8, allowing + 0'',68 for loss of clock, and + 0'',16 for change of  $\mathcal{R}$ .



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.		II.		III.		IV.		V.		VI.		VII. Wire.			Correction to Mean of Wires Observed.	Observer.
		m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	h.	m.	s.		
Aug. 10	$\alpha$ Herculis.....	46,6	0,6	14,1	28,2	42,1	55,9	17. 7. 10,0										B.
	$\alpha$ Ophiuchi.....	56,2	10,3	23,9	37,7	51,4	5,2	17. 27. 19,1										B.
	9 Sagittarii.....	27,1	41,3	56,1	11,3	25,9	40,4	17. 53. 55,2										B.
	A.S.C. 2151.....	.....	.....	.....	41,2	55,3	9,8	18. 28. 23,4									- 21,17	B.
	$\alpha$ Aquilæ.....	25,5	39,1	52,8	6,3	19,7	33,3	19. 42. 46,9										B.
	(a) $\beta$ Aquilæ.....	.....	.....	21,1	34,6	48,2	2,1	19. 47. 15,3									- 13,50	B.
	$\alpha^2$ Capricorni.....	36,3	50,2	4,1	18,0	31,7	45,3	20. 8. 59,2										B.
	(b) * N.P.D. 60°. 26'.....	30,1	.....	1,2	16,7	32,1	47,2	21. 1. 2,7									- 5,15	B.
	(c) * N.P.D. 76°. 45'.....	26,2	40,0	53,2	7,7	21,2	35,0	21. 8. 48,9										B.
	* N.P.D. 75°. 23'.....	31,7	45,4	.....	13,3	27,2	41,4	21. 19. 54,9									- 2,35	B.
	$\iota$ Cephei.....	31,7	3,5	35,1	8,0	40,2	12,2	22. 44. 44,7										B.
Aug. 12	$\delta$ Ursæ Minoris.....	12. 3,7	15.49,7	.....	23.21,6	27. 7,6	.....	18. ....									+ 3.45,69	B.
	$\alpha^2$ Capricorni.....	33,8	47,8	1,3	15,3	29,2	42,9	20. 8. 56,8										B.
	* N.P.D. 60°. 26'.....	10,3	25,9	40,9	56,5	12,3	28,0	21. 1. 43,1										B.
	$\beta$ Aquarii.....	32,1	.....	58,9	12,9	26,6	40,1	21. 22. 53,3									- 4,50	B.
	(d) $\alpha$ Aquarii.....	.....	.....	.....	39,2	51,9	6,2	21. 57. 19,1									- 20,21	B.
	Castor.....	36,8	52,7	8,1	24,4	40,3	56,0	7. 24. 12,1										B.
	Procyon.....	16,8	30,0	43,3	57,0	10,7	24,1	7. 30. 37,6										B.
	Pollux.....	47,2	1,9	16,9	32,5	47,7	3,3	7. 35. 18,6										B.
Aug. 13	☉ 1 L. } ..... (cloudy)	54,3	8,4	22,4	.....	51,5	4,9	9. 28. 18,3									+ 0,01	B.
	☉ 2 L. } ..... (cloudy)	7,1	21,0	34,8	49,0	3,0	.....	9. 30. ....									+ 13,95	B.
Aug. 15	Castor.....	33,3	48,9	4,9	21,0	36,9	52,7	7. 24. 8,9										B.
	Pollux.....	43,0	58,2	13,4	29,0	44,2	59,7	7. 35. 15,1										B.
Aug. 16	$\alpha^2$ Libræ.....	19,0	32,8	46,6	1,1	15,1	28,5	14. 41. 43,1										B.
	☽ 1 L.....	.....	.....	.....	37,1	52,0	7,0	14. 47. 21,3									- 22,28	B.
Aug. 17	Mars 1 L.....	4,8	18,7	32,1	46,2	59,7	13,5	13. 47. 27,2										B.
	$\alpha$ Herculis.....	38,0	51,7	5,7	19,5	33,4	47,2	17. 7. 1,3										B.
	$\alpha$ Ophiuchi.....	47,8	1,8	15,2	29,1	42,8	56,4	17. 27. 10,3										B.
Aug. 19	$\alpha$ Aquilæ.....	14,1	27,8	41,2	55,1	8,4	22,1	19. 42. 35,9										B.
	$\beta$ Aquilæ.....	42,9	56,8	10,1	23,5	37,1	51,0	19. 47. 4,1										B.
	$\alpha^2$ Capricorni.....	25,2	.....	53,1	7,0	20,8	34,3	20. 8. 48,1									- 4,60	B.
Aug. 20	Antares.....	45,8	0,9	15,4	30,9	45,8	0,7	16. 20. 15,8										B.
	$\alpha$ Herculis.....	34,1	47,9	2,0	16,0	30,0	43,6	17. 7. 57,7										B.
	$\alpha$ Ophiuchi.....	44,0	58,1	11,5	25,3	39,1	53,1	17. 28. 6,9										B.
	$\gamma^2$ Sagittarii.....	40,1	55,4	11,1	26,8	42,3	57,9	17. 56. 13,5										B.
	$\delta$ Sagittarii.....	53,9	9,2	24,2	40,1	56,0	11,2	18. 11. 27,0										B.
	$\delta$ Ursæ Minoris.....	12.53,8	16.38,2	20.19,8	24. 9,3	.....	.....	18. 35. 28,7									+ 2. 15,63	B.
	(e) ☽ 1 L.....	54,2	10,1	25,3	42,0	57,9	13,3	18. 29. 29,1										B.
	$\sigma$ Sagittarii.....	.....	45,7	0,2	15,7	30,7	45,6	18. 46. 0,9									- 7,50	B.
	$\tau$ Sagittarii.....	6,7	21,7	37,1	52,0	7,3	22,4	18. 57. 37,9										B.
	$\alpha$ Aquilæ.....	13,2	27,1	40,3	54,0	7,7	21,2	19. 43. 34,4										B.
	$\beta$ Aquilæ.....	41,8	55,4	9,1	22,4	36,2	49,3	19. 48. 3,1										B.
	$\alpha^2$ Capricorni.....	24,1	38,0	51,7	6,1	19,8	33,2	20. 9. 47,1										B.
	(f) * N.P.D. 26°. 38'.....	36,5	6,3	36,1	6,6	36,2	6,0	20. 25. 35,8										B.
	(f) * N.P.D. 25°. 0'.....	44,9	17,1	47,7	20,2	51,8	23,8	21. 3. 55,9										B.
	(f) * N.P.D. 75°. 23'.....	20,3	.....	47,2	1,7	14,9	29,3	21. 20. ....									+ 2,79	B.
	* N.P.D. 24°. 20'.....	44,1	17,1	49,0	22,0	54,7	27,1	22. 36. 59,9										B.
	$\alpha$ Pegasi.....	1,2	15,0	28,9	43,2	57,0	10,7	22. 57. 24,3										B.
	Uranus.....	43,4	57,2	10,3	24,1	37,7	51,1	23. 7. 5,1										B.
	$\delta$ Ursæ Minoris SP....	12.49,2	16.35,5	20.20,8	24. 6,5	27.57,6	31.40,3	6. 35. 27,4										B.
	Castor.....	27,9	43,7	59,1	15,3	30,9	47,2	7. 25. 3,1										B.
	Pollux.....	37,5	53,1	7,9	23,3	38,9	54,1	7. 36. 9,2										B.
Aug. 21	(g) ☉ 2 L.....	51,1	5,0	18,9	32,5	46,3	0,2	10. 1. 14,0										B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, *ABCDEFGH*.Aug. 19, 22<sup>h</sup>, the clock was put forward 1<sup>m</sup>.Transit levelled Aug. 20, 7<sup>h</sup>.

(a) Hurried.

(b) Very faint. See the note to the observation of Aug. 5.

(c) Mistaken for the star observed Aug. 5. The N.P.D. is conjectural.

(d) A very unsatisfactory observation.

(e) Ragged and very unsteady.

(f) Very faint. The stars are of about the 9th magnitude.

(g) Cloudy with much motion.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
17. 6. 28,22		+ 1,80	28,36	21,25	52,89	1,30	51,79	17. 7. 21,07	$\alpha$ Herculis.
17. 26. 37,69			37,83	30,61	52,78			17. 27. 30,56	$\alpha$ Ophiuchi.
17. 53. 11,04			11,15					17. 54. 3,91	9 Sagittarii.
18. 27. 41,25			41,37					18. 28. 34,16	A.S.C. 2151.
19. 42. 6,23			6,36	58,96	52,60			19. 42. 59,22	$\alpha$ Aquilæ.
19. 46. 34,76			34,89	27,62	52,73			19. 47. 27,75	$\beta$ Aquilæ.
20. 8. 17,83			17,95	10,79	52,84			20. 9. 10,83	$\alpha^2$ Capricorni.
21. 0. 16,52			16,65					21. 1. 9,58	* N.P.D. 60°. 26'.
21. 8. 7,46			7,60					21. 9. 0,54	* N.P.D. 76°. 45'.
21. 19. 13,30			13,44					21. 20. 6,39	* N.P.D. 75°. 23'.
22. 43. 7,92			8,05					22. 44. 1,07	$\epsilon$ Cephei.
18. 23. 21,34			21,33	16,55	55,22	1,38	54,18	18. 24. 16,57	$\delta$ Ursæ Minoris.
20. 8. 15,30			15,42	10,80	55,38			20. 9. 10,76	$\alpha^2$ Capricorni.
21. 0. 56,72			56,85					21. 1. 52,24	* N.P.D. 60°. 26'.
21. 22. 12,82			12,94	8,44	55,50			21. 23. 8,35	$\beta$ Aquarii.
21. 56. 38,89			39,02	34,33	55,31			21. 57. 34,46	$\alpha$ Aquarii.
7. 23. 24,34			24,48	20,56	56,08	1,50	55,59	7. 24. 20,53	Castor.
7. 29. 57,07			57,20	53,31	56,11			7. 30. 53,26	Procyon.
7. 34. 32,58			32,71	28,70	55,99			7. 35. 28,77	Pollux.
9. 27. 36,64									
9. 29. 48,93			42,93					9. 29. 39,11	$\odot$ 's center.
7. 23. 20,94		+ 1,83	21,08	20,63	59,55	1,24	59,26	7. 24. 20,72	Castor.
7. 34. 28,95			29,08	28,77	59,69			7. 35. 28,73	Pollux.
14. 41. 0,88			1,00	1,08	60,08			14. 42. 1,02	$\alpha^2$ Libræ.
14. 46. 37,07			37,19					14. 47. 37,21	$\gamma$ 1 L.
13. 46. 46,03			46,15			1,22	60,52	13. 47. 47,37	Mars 1 L.
17. 6. 19,55			19,69	21,16	61,47			17. 7. 21,08	$\alpha$ Herculis.
17. 26. 29,06			29,20	30,52	61,32			17. 27. 30,60	$\alpha$ Ophiuchi.
19. 41. 54,94			55,08	58,94	63,86	1,15	62,90	19. 42. 58,92	$\alpha$ Aquilæ.
19. 46. 23,64			23,77	27,60	63,83			19. 47. 27,62	$\beta$ Aquilæ.
20. 8. 6,82			6,94	10,81	63,87			20. 9. 10,81	$\alpha^2$ Capricorni.
16. 19. 30,75			30,86	35,78	4,92	1,09	4,09	16. 19. 35,69	Antares.
17. 7. 15,90			16,04	21,11	5,07			17. 7. 20,91	$\alpha$ Herculis.
17. 27. 25,43			25,57	30,49	4,92			17. 27. 30,45	$\alpha$ Ophiuchi.
17. 55. 26,73			26,83					17. 55. 31,73	$\gamma^2$ Sagittarii.
18. 10. 40,22			40,32					18. 10. 45,23	$\delta$ Sagittarii.
18. 24. 9,59	10,70		9,54	13,83	4,29			18. 24. 14,46	$\delta$ Ursæ Minoris.
18. 28. 41,70			41,80					18. 28. 46,73	$\gamma$ 1 L.
18. 45. 15,63			15,74					18. 45. 20,68	$\sigma$ Sagittarii.
18. 56. 52,15			52,26					18. 56. 57,21	$\tau$ Sagittarii.
19. 42. 53,99			54,13	58,93	4,80			19. 42. 59,11	$\alpha$ Aquilæ.
19. 47. 22,47			22,60	27,60	5,00			19. 47. 27,59	$\beta$ Aquilæ.
20. 9. 5,71			5,83	10,81	4,98			20. 9. 10,83	$\alpha^2$ Capricorni.
20. 24. 6,21			6,34					20. 24. 11,35	* N.P.D. 26°. 38'.
21. 2. 20,20			20,33					21. 2. 25,37	* N.P.D. 25°. 0'.
21. 20. 1,47			1,61					21. 20. 6,67	* N.P.D. 75°. 23'.
22. 35. 21,98			22,10					22. 35. 27,22	* N.P.D. 24°. 20'.
22. 56. 42,90			43,04	48,06	5,02			22. 56. 48,17	$\alpha$ Pegasi.
23. 6. 24,13			24,26					23. 6. 29,40	Uranus.
6. 24. 8,19	7,24		8,59	13,64	5,05	1,05	5,11	18. 24. 13,98	$\delta$ Ursæ Min. SP.
7. 24. 15,31			15,45	20,76	5,31			7. 24. 20,88	Castor.
7. 35. 23,43			23,56	28,90	5,34			7. 35. 29,00	Pollux.
10. 0. 32,57			32,70					10. 0. 38,25	$\odot$ 2 L.

Error of Collimation =  $-0''.73$ .Level Error =  $+2''.01$ . From Aug. 17 =  $+1''.99$ .Meridian Error from Aug. 15 by  $\delta$  Ursæ Minoris,  $\delta$  Ursæ Minoris SP, and  $\delta$  Ursæ Minoris Aug. 20 and 21.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Aug. 21	Antares.....	44,8	59,8	14,4	29,9	44,9	59,9	16.20.14,6		B.
	$\alpha$ Herculis.....	33,4	47,1	0,8	15,1	29,0	43,1	17.7.56,6		B.
	$\alpha$ Ophiuchi.....	43,1	57,1	10,4	24,4	38,1	52,0	17.28.5,7		B.
	(a) $\delta$ Ursæ Minoris.....	12.48,8	16.36,3	20.17,4	24.7,8	27.54,2	31.41,7	18.35.27,6		B.
	$\sigma$ Sagittarii.....	...	44,7	59,3	15,1	29,3	44,8	18.45.59,9	-7,50	B.
	$\tau$ Sagittarii.....	5,4	20,7	35,4	51,1	6,0	21,4	18.57.37,0		B.
	(b) $\eta$ 1 L.....	32,1	47,7	3,1	19,0	34,3	50,1	19.29.5,5		B.
	$\alpha$ Aquilæ.....	12,1	25,7	39,1	53,0	6,3	20,1	19.43.33,7		B.
	$\beta$ Aquilæ.....	40,9	54,7	8,0	21,7	35,1	48,3	19.48.2,1		B.
	$c$ Sagittarii.....	57,2	13,1	27,5	43,1	58,4	13,9	19.53.29,1		B.
	$\sigma$ Capricorni.....	20,9	34,9	49,2	3,7	18,1	32,1	20.10.46,4		B.
	* N.P.D. 26°.38'.....	...	...	35,2	5,3	35,7	5,9	20.25.35,3	-29,93	B.
	* N.P.D. 25°.0'.....	43,7	15,6	47,0	19,1	49,9	22,4	21.3.54,2		B.
	* N.P.D. 24°.20'.....	...	...	...	21,2	53,8	26,2	22.36.59,1	-49,03	B.
	$\alpha$ Pegasi.....	0,2	14,2	27,7	41,8	55,5	9,4	22.57.23,3		B.
	Uranus.....	34,1	47,4	1,1	14,6	28,0	41,8	23.6.55,2		B.
Aug. 22	(c) $\odot$ 2 L.....	32,0	45,9	...	...	27,2	...	10.4. ....	+18,33	B.
	(d) Venus 1 L.....	37,0	50,3	4,2	17,9	31,2	45,2	12.35.58,3		B.
	$\alpha$ Herculis.....	32,1	46,1	59,7	14,0	27,7	41,3	17.7.55,3		B.
	$\alpha$ Ophiuchi.....	41,6	55,8	9,2	23,1	37,0	50,7	17.28.4,9		B.
	64 Serpentis.....	26,6	40,0	53,2	6,7	20,1	33,7	18.49.47,1		B.
	$\alpha$ Aquilæ.....	10,9	24,3	38,0	51,4	5,2	18,8	19.43.32,3		B.
	$\beta$ Aquilæ.....	40,1	53,4	6,7	20,3	34,1	47,3	19.48.1,1		B.
	$c$ Sagittarii.....	56,1	11,6	26,1	41,9	57,2	12,5	19.53.27,6		B.
	$\eta$ 1 L.....	10,4	25,1	40,0	55,3	10,7	26,0	20.27.41,0		B.
	$\eta$ Capricorni.....	27,7	41,9	55,9	11,2	25,2	39,8	20.55.54,4		B.
	$s$ Capricorni.....	...	...	32,0	46,2	0,3	14,2	21.7.28,3	-13,96	B.
	$i$ Cephei.....	17,2	49,3	21,4	54,0	26,0	58,2	22.45.30,9		B.
	$\alpha$ Pegasi.....	59,0	12,9	26,3	40,8	55,0	8,7	22.57.22,1		B.
	(e) Uranus.....	25,0	38,3	51,7	5,2	19,1	32,0	23.6.45,5		B.
Aug. 23	$\alpha$ Coronæ Borealis....	0,9	16,0	30,9	46,3	1,4	16,7	15.28.31,6		B.
	$\alpha$ Serpentis.....	34,0	47,5	0,9	14,6	28,0	41,7	15.36.55,1		B.
	Antares.....	42,8	57,8	12,3	27,8	...	...	16.19. ....	+22,47	B.
	$\alpha$ Ophiuchi.....	41,0	54,7	8,2	22,2	36,0	49,8	17.28.3,7		B.
	$\eta$ 1 L..... (unsteady)	52,1	6,9	21,1	36,0	50,5	5,0	21.24.20,0		B.
	$\delta$ Capricorni.....	22,4	36,4	50,3	4,5	18,7	32,6	21.38.46,9		B.
	$\lambda$ Aquarii.....	58,0	12,0	25,8	39,9	53,5	7,1	21.58.21,6		B.
	$\alpha$ Pegasi.....	58,1	...	25,5	39,5	53,6	7,5	22.57.21,0	-4,62	B.
	(e) Uranus.....	15,1	28,5	42,0	55,8	9,1	...	23.6. ....	+13,55	B.
Aug. 24	$\odot$ 1 L. } (clouds)	42,0	55,8	9,1	22,9	37,0	50,8	10.9. ....	+6,88	B.
	$\odot$ 2 L. }	52,0	5,7	19,0	...	...	...	10.11. ....	+27,53	B.
	(f) $\eta$ 1 L.....	31,1	45,3	59,2	13,5	27,4	41,9	22.18.55,9		B.
	$\eta$ 2 L.....	47,0	1,2	15,1	29,4	43,3	57,9	22.21.12,0		B.
	(g) $\lambda$ Aquarii.....	24,9	39,1	52,4	6,2	20,1	33,9	22.44.47,2		B.
	$\alpha$ Pegasi.....	56,2	10,2	23,8	38,1	51,8	5,8	22.57.19,8		B.
	(e) Uranus.....	5,6	19,0	32,5	...	...	13,2	23.6.26,4	+2,72	B.
Aug. 25	$\beta$ Aquarii.....	16,4	30,1	43,2	57,0	10,8	24,1	21.23.38,0		B.
	$\alpha$ Aquarii.....	42,8	56,2	9,4	23,1	36,3	49,9	21.58.3,2		B.
	$\lambda$ Aquarii.....	24,1	38,2	51,1	5,2	18,7	32,3	22.44.46,2		B.
	$\alpha$ Pegasi.....	55,0	8,9	22,9	36,7	50,6	4,4	22.57.18,2		B.
	Uranus.....	54,8	8,8	22,0	35,6	49,2	2,9	23.6.16,3		B.
	$\eta$ 2 L.....	52,9	7,0	20,4	34,3	48,2	2,2	23.14.16,3		B.
	$\lambda$ Piscium.....	1,9	15,2	28,1	42,1	55,3	9,1	23.34.22,2		B.
	$q$ Piscium.....	46,1	59,7	13,2	26,4	40,1	53,4	23.54.7,1		B.
	$\alpha$ Andromedæ.....	11,1	26,1	41,0	56,3	11,9	27,2	0.0.42,0		B.
Aug. 26	$\odot$ 1 L.....	0,7	14,4	27,6	41,7	55,4	9,0	10.17.22,8		C.
	$\odot$ 2 L..... (clouds)	9,8	23,5	36,9	51,0	4,5	18,3	10.19. ....	+6,86	C.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, ABCDEFG.

- (a) Very steady. (b) Vibrating.  
 (c) Cloudy with much motion.  
 (d) Faint.  
 (e) Cloudy. The observation of Aug. 24 very doubtful.

- (f) Unsteady. Correction applied to apparent R. of 1 L for defect of illumination = -0,03.  
 (g) Cloudy and very bad. Wire IV was written down 7,2.





Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Aug. 27	(a) ☉ 1 L.....	39,0	52,7	6,3	19,8	33,7	47,7	10.21.1,4		C.
	* N.P.D. 60°. 26'.....	52,5	8,0	23,1	39,0	54,5	9,8	21. 2.25,3		C.
	* N.P.D. 76°. 43'.....	23,2	36,7	50,5	4,7	18,4	32,2	21. 9.46,0		C.
	β Aquarii.....	14,5	28,0	41,1	54,9	8,5	22,0	21.23.35,6		C.
	α Aquarii.....	40,6	54,0	7,2	20,8	34,4	48,0	21.58.1,4		C.
	(b) * N.P.D. 24°. 20'.....	.....	8,3	40,2	13,6	46,1	19,0	22.36.51,7	-16,80	C.
	ι Cephei.....	11,0	43,2	14,8	47,8	20,0	52,3	22.45.24,5		C.
	α Pegasi.....	53,0	6,6	20,4	34,5	48,4	2,3	22.57.16,0		C.
	Uranus.....	35,6	49,3	2,5	16,4	29,8	43,5	23. 5.57,0		C.
	ς Cephei.....	25,2	4,0	41,4	20,4	58,7	37,1	23.22.15,8		C.
	γ Cephei.....	29.42,5	30.41,2	31.38,7	32.38,2	33.37,1	34.35,6	23.35.34,3		C.
	* N.P.D. 25°. 26'.....	55,2	26,6	57,0	29,4	0,8	31,7	23.55.3,0		C.
	α Andromedæ.....	8,7	23,9	38,8	54,3	9,5	24,8	0. 0.40,0		C.
Aug. 28	α Aquilæ..... (cloudy)	.....	.....	.....	44,1	57,9	11,6	19.43.25,2	-20,43	G.
	β Aquarii.....	13,4	27,0	40,1	53,9	7,4	21,0	21.23.34,5		C.
Aug. 29	(c) ☉ 2 L.....	4,4	17,9	.....	45,5	59,0	.....	10.29. ....	+13,63	C.
	Venus 1 L.....	9,5	22,7	36,4	50,3	4,1	17,7	12.49.31,4		C.
	α Pegasi.....	50,7	4,4	18,0	32,2	46,0	59,8	22.57.13,8		C.
	Uranus.....	15,8	29,5	42,7	56,5	10,0	23,5	23. 5.37,2		C.
	(d) ς Cephei.....	.....	.....	39,0	17,9	56,6	.....	23.22.13,0	-28,64	C.
	γ Cephei..... (cloudy)	29.40,1	30.39,0	.....	.....	.....	34.33,4	23.35.31,2	-0,17	C.
	α Ophiuchi.....	32,2	45,8	59,5	13,4	27,2	40,8	17.27.54,6		C.
	α Aquilæ.....	1,0	14,6	28,0	41,7	55,2	8,8	19.43.22,5		C.
Aug. 30	β Aquilæ.....	30,1	43,5	56,7	10,5	23,8	37,5	19.47.51,0		C.
Aug. 31	(e) υ <sup>1</sup> Tauri.....	.....	56,0	.....	25,2	39,6	54,3	4.17. 8,7	-11,68	C.
	Aldebaran.....	43,3	57,3	11,0	25,3	39,4	53,1	4.27. 7,2		C.
	υ <sup>2</sup> L.....	16,8	32,5	48,0	3,8	19,5	35,4	5. 0.51,0		C.
	Rigel.....	50,7	4,4	17,7	31,5	45,0	58,7	5. 7.12,4		C.
	β Tauri.....	5,2	20,5	35,5	51,1	6,4	21,6	5.16.36,9		C.
	γ Tauri.....	10,7	26,0	40,7	56,4	11,5	26,5	5.43.41,6		C.
	α Orionis.....	30,2	43,5	56,7	10,6	24,4	37,7	5.46.51,4		C.
Sept. 1	(f) δ Ursæ Minoris SP....	.....	16.16,8	20. 1,4	23.49,2	27.39,5	31.21,0	6.35. 8,2	-1.53,29	C.
	(g) Castor.....	.....	.....	45,0	1,3	17,1	33,1	7.24.48,9	-15,89	C.
	Procyon.....	53,4	6,6	20,0	33,8	47,3	0,7	7.31.14,4		C.
	Pollux.....	23,5	38,8	53,6	9,4	24,5	39,7	7.35.55,2		C.
Sept. 2	☉ 1 L.....	24,4	37,7	51,2	4,8	18,5	32,3	10.42.45,6		C.
	☉ 2 L.....	32,6	46,4	59,6	13,6	27,0	40,8	10.44.54,5		C.
	(h) Venus 1 L.....	.....	.....	.....	45,5	59,2	12,8	12.55.26,4	-20,65	C.
	β Aquarii.....	7,4	21,1	34,2	48,0	1,5	14,9	21.23.28,4		C.
Sept. 3	δ Ursæ Minoris.....	.....	16.13,8	19.55,7	23.46,5	27.32,4	31.18,6	16.35. 4,5	-1.53,05	C.
	(i) * N.P.D. 87°. 44'.....	20,6	34,2	47,5	1,1	14,5	28,0	18.48.41,4		C.
	(k) β Aquarii.....	6,4	20,1	33,3	47,0	0,5	13,9	21.23.27,5		C.
Sept. 4	α Herculis.....	16,8	30,6	44,3	58,5	12,6	26,4	17. 7.40,1		C.
	α Ophiuchi.....	26,5	40,4	53,8	7,8	21,6	35,4	17.27.49,3		C.
	δ Ursæ Minoris.....	.....	.....	19.54,6	23.45,0	27.30,8	31.17,3	18.35. 4,2	-3.46,09	C.
	α Aquilæ.....	55,7	9,2	22,4	36,2	49,9	3,4	19.43.17,1		G.
	β Aquilæ.....	24,4	37,9	51,1	5,0	18,7	32,1	19.47.45,4		G.
	β Aquarii.....	5,2	18,9	32,1	46,1	59,2	13,1	21.23.26,6		G.
	α Aquarii.....	31,5	45,0	58,3	11,8	25,3	38,6	21.57.52,3		C.
	Uranus.....	16,5	30,0	43,4	57,3	10,6	24,0	23. 4.37,7		C.
Sept. 5	Castor.....	9,4	25,4	40,8	57,2	12,8	28,7	7.24.54,7		C.
	Procyon.....	49,0	2,5	15,8	29,6	43,0	56,5	7.31.10,2		C.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, *ABCDEFGH*.  
Transit levelled Sept. 6, 2<sup>h</sup>.

(a) Not good. (b) The counting was found 1<sup>s</sup> in defect, and the observation has been altered accordingly. (c) Extremely cloudy and perplexing. (d) Cloudy. The last wire was considered good. (e) Very cloudy and doubtful. (f) Wire II cloudy and very faint. (g) Hurried. (h) Hurried. The seconds were not taken from the clock, and the observation as recorded has been diminished 25<sup>s</sup>. (i) Unsatisfactory. (k) Confused. The counting was found 30<sup>s</sup> in error.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>//</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
10.20.20,09		+ 0,85	20,18			1,11	12,50	10.20.33,15	☉ 1 L.
21. 1.38,89			38,99					21. 1.52,46	* N.P.D. 60°.26'.
21. 9. 4,53			4,63					21. 9.18,11	* N.P.D. 76°.43'.
21.22.54,94			55,01	8,53	13,52			21.23. 8,50	β Aquarii.
21.57.20,91			20,99	34,47	13,48			21.57.34,50	α Aquarii.
22.35.13,52			13,68					22.35.27,22	* N.P.D. 24°.20'.
22.43.47,66			47,82					22.44. 1,37	ι Cephei.
22.56.34,46			34,56	48,15	13,59			22.56.48,12	α Pegasi.
23. 5.16,30			16,37					23. 5.29,94	Uranus.
23.20.20,37			20,54					23.20.34,12	ς Cephei.
23.32.38,23			38,45					23.32.52,04	γ Cephei.
23.53.29,10			29,26					23.53.42,86	* N.P.D. 25°.26'.
23.59.54,28			54,39	7,95	13,56			0. 0. 8,00	α Andromedæ.
19.42.44,27			44,36	58,89	14,53	1,18	13,54	19.42.58,87	α Aquilæ.
21.22.53,90			53,97	8,54	14,57			21.23. 8,56	β Aquarii.
10.29.45,33			45,42			1,26	14,73	10.30. 0,70	☉ 2 L.
12.48.50,30			50,36					12.49. 5,76	Venus 1 L.
22.56.32,13			32,23	48,17	15,94			22.56.48,16	α Pegasi.
23. 4.56,46			56,53					23. 5.12,47	Uranus.
23.20.17,99			18,16					23.20.34,11	ς Cephei.
23.32.35,75			35,97					23.32.51,93	γ Cephei.
17.27.13,36			13,46	30,34	16,88	1,20	16,05	17.27.30,38	α Ophiuchi.
19.42.41,68			41,77	58,87	17,10			19.42.58,81	α Aquilæ.
19.47.10,44			10,52	27,55	17,03			19.47.27,56	β Aquilæ.
4.16.25,08			25,21			1,13	18,37	4.16.43,78	υ <sup>1</sup> Tauri.
4.26.25,23			25,35	43,89	18,54			4.26.43,93	Aldebaran.
5. 0. 3,86			4,00					5. 0.22,61	☽ 2 L.
5. 6.31,48			31,56	50,23	18,67			5. 6.50,17	Rigel.
5.15.51,03			51,17	9,64	18,47			5.16. 9,79	β Tauri.
5.42.56,20			56,34					5.43.14,98	γ Tauri.
5.46.10,64			10,75	29,50	18,75			5.46.29,39	α Orionis.
6.23.49,39	48,09		48,72	9,20	20,48	1,10	19,51	18.24. 8,52	δ Ursæ Min. SP.
7.24. 1,19			1,33	21,10	19,77			7.24.21,18	Castor.
7.30.33,74			33,84	53,77	19,93			7.30.53,69	Procyon.
7.35. 9,25			9,39	29,21	19,82			7.35.29,25	Pollux.
10.42. 4,93			9,33					10.43.29,33	☉'s center.
10.44.13,50			45,39					12.55. 5,49	Venus 1 L.
12.54.45,32			48,01	8,54	20,53			21.23. 8,50	β Aquarii.
21.22.47,93									
18.23.45,53	47,03		46,49	8,56	22,07	1,03	20,57	18.24. 7,85	δ Ursæ Minoris.
18.48. 1,04			1,13					18.48.22,51	* N.P.D. 87°.44'.
21.22.46,96			47,04	8,53	21,49			21.23. 8,53	β Aquarii.
17. 6.58,48			58,60	20,88	22,28	1,06	21,58	17. 7.20,93	α Herculis.
17.27. 7,83			7,95	30,26	22,31			17.27.30,30	α Ophiuchi.
18.23.44,29			45,25	8,13	22,88			18.24. 7,64	δ Ursæ Minoris.
19.42.36,27			36,38	58,82	22,44			19.42.58,83	α Aquilæ.
19.47. 4,94			5,04	27,50	22,46			19.47.27,49	β Aquilæ.
21.22.45,89			45,97	8,53	22,56			21.23. 8,49	β Aquarii.
21.57.11,83			11,93	34,49	22,56			21.57.34,48	α Aquarii.
23. 3.57,07			57,15					23. 4.19,75	Uranus.
7.23.57,00		+ 1,18	57,15	21,23	24,08	1,14	23,77	7.24.21,27	Castor.
7.30.29,52			29,64	53,87	24,23			7.30.53,77	Procyon.

Error of Collimation = -0",73.

Level Error = +1",99. From Aug. 31 = +2",41.

Meridian Error from Sept. 5 by bisection of Grantchester Cross on Sept. 7. (See Introduction.)



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Sept. 5	(a) Pollux.....	19,4	34,5	49,4	5,0	20,4	35,7	7.35.50,9		C.
Sept. 6	(b) ☉ 1 L.....	48,6	2,4	15,7	29,5	42,8	56,5	10.57.9,7		C.
	☉ 2 L..... (cloud)	57,0	10,5	...	37,5	51,2	4,5	10.59.18,3	- 2,30	C.
	α Ophiuchi.....	24,2	38,0	51,5	5,5	19,4	33,0	17.27.46,8		C.
	(c) δ Ursæ Minoris.....	...	...	19.51,0	23.40,6	27.26,8	31.13,7	18.35.1,0	- 3.46,10	C.
	α Aquilæ.....	53,2	6,7	20,2	33,8	47,5	1,0	19.43.14,7		C.
	β Aquilæ.....	22,0	35,7	48,8	2,6	16,3	29,7	19.47.43,3		C.
	α² Capricorni.....	4,6	18,5	32,0	46,2	59,7	13,7	20.9.27,5		C.
	(d) α Aquarii.....	...	42,9	56,0	9,6	22,9	36,5	21.57.49,9	- 6,71	C.
	α Pegasi.....	41,5	55,6	9,2	23,5	37,3	50,9	22.57.5,0		C.
	Uranus.....	56,5	9,8	23,2	36,9	50,6	4,0	23.4.17,7		C.
	Castor.....	8,3	24,3	39,7	56,0	11,8	27,7	7.24.43,6		C.
	Procyon.....	47,9	1,4	14,6	28,5	41,9	55,5	7.31.9,0		C.
	Pollux.....	18,4	33,5	48,5	4,0	19,4	34,7	7.35.50,0		C.
Sept. 7	(e) β Aquarii.....	2,0	15,5	28,6	42,4	56,0	9,5	21.23.23,0		C.
	(f) α Aquarii.....	...	...	54,7	8,5	21,6	35,3	21.57.48,5	- 13,43	C.
Sept. 9	☉ 1 L..... (cloud)	...	...	...	15,3	28,8	42,4	11.7.55,8	- 20,34	C.
	☉ 2 L.....	42,7	56,3	9,5	23,3	36,8	50,6	11.10.3,9		C.
	(g) Venus 1 L.....	27,7	41,4	54,8	9,3	22,7	36,8	13.1.50,7		C.
	Arcturus.....	9,6	24,0	38,1	52,5	6,9	21,3	14.8.35,5		C.
	α Ophiuchi.....	20,6	34,5	47,8	1,9	15,7	29,4	17.27.43,3		C.
	δ Ursæ Minoris.....	...	...	...	...	27.21,5	31.9,4	18.34.55,7	- 7.33,28	C.
	* N.P.D. 87°.44'.....	13,7	27,3	40,4	54,1	7,5	21,0	18.48.34,6		C.
	A.S.C. 2212.....	11,8	27,2	42,3	58,0	13,4	28,6	18.57.44,0		C.
	○ Sagittarii.....	34,6	50,2	5,5	21,3	36,6	52,3	19.17.8,0		C.
	α Aquilæ.....	49,6	3,4	16,6	30,5	44,0	57,5	19.43.11,4		C.
	β Aquilæ.....	18,6	32,1	45,4	59,0	12,5	26,2	19.47.39,7		C.
	(h) α² Capricorni.....	1,2	14,7	28,4	42,4	56,3	10,0	20.9.24,0		C.
	(i) α Pegasi.....	38,0	52,0	5,4	19,8	33,6	47,5	22.57.1,5		C.
	(k) Uranus.....	26,1	39,7	53,1	6,7	20,3	33,8	23.3.47,4		C.
Sept. 10	☉ 1 L.....	9,6	23,4	36,3	50,1	3,6	17,3	11.11.30,7		C.
	☉ 2 L.....	17,6	31,3	44,6	58,3	11,8	25,4	11.13.39,0		C.
	Venus 1 L.....	54,4	7,8	21,8	35,6	49,6	3,3	13.2.17,3		C.
Sept. 12	α Pegasi..... (blur)	34,6	48,7	2,5	16,3	30,4	44,0	22.56.48,2		C.
	(l) Uranus.....	...	...	...	36,7	50,0	3,7	23.3.17,0	- 20,35	C.
	(m) Pollux.....	11,5	26,7	41,7	57,3	12,5	28,0	7.35.43,3		C.
Sept. 13	(n) ☉ 1 L.....	35,8	51,0	6,0	21,2	36,1	51,5	15.18.6,8		G.
	α Coronæ Bor... (cloudy)	36,1	51,2	6,0	...	...	51,7	15.27.....	+ 15,17	G.
	α Serpentis.....	9,1	22,6	36,0	49,9	3,4	16,9	15.36.30,8		G.
	α Aquilæ.....	45,2	58,9	12,2	26,1	39,4	53,0	19.43.6,8		G.
	β Aquilæ.....	14,2	27,7	41,0	54,9	8,3	21,8	19.47.35,2		G.
	α Pegasi.....	34,0	47,9	1,4	15,5	29,4	43,3	22.56.57,1		G.
	Uranus.....	46,3	59,7	13,0	26,8	40,5	...	23.2.....	+ 13,56	G.
Sept. 14	(o) ☉ 1 L.....	...	...	55,1	8,8	...	...	11.25.....	+ 6,84	C.
	☉ 2 L.....	...	...	2,6	...	29,9	43,7	11.27.57,4	- 16,85	C.
Sept. 15	(p) ☉ 1 L.....	3,8	19,8	35,3	51,3	7,0	22,8	17.5.38,7		C.
	(q) p. Sagittarii.....	8,7	24,0	38,6	54,4	9,3	24,7	17.37.39,4		C.
	α Aquilæ.....	43,1	56,7	10,0	24,0	37,5	51,1	19.43.4,7		C.
	β Aquilæ.....	12,0	25,5	38,9	52,6	6,2	19,7	19.47.33,2		C.
	α² Capricorni.....	54,6	8,4	21,8	35,8	49,7	3,7	20.9.17,3		C.
Sept. 16	(r) Venus 1 L.....	...	1,9	15,7	29,8	43,7	57,6	13.2.11,5	- 6,94	C.
	Procyon.....	37,4	50,7	4,0	18,0	31,4	44,8	7.30.58,5		C.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, ABCDEFG.  
Transit levelled Sept. 18, 4<sup>h</sup>.

- (a) Wire VII was written down 49,9 evidently by mistake. (b) The observation of 1 L unsatisfactory, the eye-glass being not well in focus.  
(c) An error of 5<sup>s</sup> detected in the counting for wire VI. (d) Hurried. Seconds not taken from clock. (e) Very loud wind. (f) Hurried: disturbed also by the wind. (g) Extremely unsteady. Cloudy at wire I. (h) Not satisfactory. (i) Wire II was written down 53,0.  
(k) The counting being found 1<sup>s</sup> in excess, the three last wires have each been diminished 1<sup>s</sup>. (l) Cloudy and ill-defined. The counting was 1<sup>s</sup> in defect, and the three last wires have been altered accordingly. (m) Wire III was written down 40,7; wire VII was written confusedly 42,7 and altered immediately after. (n) Doubtful, the Moon so misty. (o) Extremely cloudy: the observation is worth little. (p) Faint and unsatisfactory.  
(q) Extremely faint and doubtful; the two last wires mere guess. (r) Cloudy.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
7.35.50,04		+1,18	5,19	29,33	24,14	1,14	23,77	7.35.29,32	Pollux.
10.56.29,32								10.57.57,85	☉'s center.
10.58.37,53			33,56					17.27.30,22	$\alpha$ Ophiuchi.
17.27.5,49			5,62	30,23	24,61			18.24.5,91	$\delta$ Ursæ Minoris.
18.23.40,52			41,27	7,33	26,06			19.42.58,70	$\alpha$ Aquilæ.
19.42.33,87			34,00	58,80	24,80			19.47.27,46	$\beta$ Aquilæ.
19.47.2,63			2,75	27,48	24,73			20.9.10,85	$\alpha^2$ Capricorni.
20.8.46,03			46,12	10,72	24,60			21.57.34,51	$\alpha$ Aquarii.
21.57.9,59			9,70	34,50	24,80			22.56.48,27	$\alpha$ Pegasi.
22.56.23,28			23,41	48,23	24,82			23.4.1,93	Uranus.
23.3.36,96			37,06					7.24.21,34	Castor.
7.23.55,91			56,06	21,26	25,20	1,17	24,92	7.30.53,81	Procyon.
7.30.28,40			28,52	53,89	25,37			7.35.29,51	Pollux.
7.35.4,07			4,22	29,35	25,13				
21.22.42,43			42,53	8,53	26,00			21.23.8,49	$\beta$ Aquarii.
21.57.8,29			8,40	34,50	26,10			21.57.34,39	$\alpha$ Aquarii.
11.7.15,23						1,19	27,28	11.8.47,22	☉'s center.
11.9.23,30			19,39					13.1.37,08	Venus 1 L.
13.1.9,06			9,15					14.8.20,66	Arcturus.
14.7.52,55			52,68	20,71	28,03			17.27.30,16	$\alpha$ Ophiuchi.
17.27.1,88			2,01	30,18	28,17			18.24.4,53	$\delta$ Ursæ Minoris.
18.23.35,59			36,34	6,20	29,86			18.48.22,41	* N.P.D. 87°.44'.
18.47.54,09			54,20					18.57.26,18	A.S.C. 2212.
18.56.57,90			57,96					19.16.49,50	O Sagittarii.
19.16.21,21			21,27					19.42.58,81	$\alpha$ Aquilæ.
19.42.30,42			30,55	58,77	28,22			19.47.27,46	$\beta$ Aquilæ.
19.46.59,07			59,19	27,45	28,26			20.9.10,80	$\alpha^2$ Capricorni.
20.8.42,43			42,52	10,70	28,18			22.56.48,24	$\alpha$ Pegasi.
22.56.19,69			19,82	48,25	28,43			23.3.35,25	Uranus.
23.3.6,73			6,83						
11.10.50,14						1,13	28,47	11.12.23,34	☉'s center.
11.12.58,29			54,34					13.2.4,86	Venus 1 L.
13.1.35,69			35,78						
22.56.16,39		+0,37	16,45	48,26	31,81	1,02	30,83	22.56.48,25	$\alpha$ Pegasi.
23.2.36,50			36,53					23.3.8,34	Uranus.
7.34.57,29			57,36	29,53	32,17	1,00	31,84	7.35.29,52	Pollux.
15.17.21,20			21,21					15.17.53,68	$\gamma$ 1 L.
15.27.21,42			21,49	53,95	32,46			15.27.53,97	$\alpha$ Coronæ Bor.
15.35.49,82			49,87	22,44	32,57			15.36.22,36	$\alpha$ Serpentis.
19.42.25,94			25,99	58,71	32,72			19.42.58,65	$\alpha$ Aquilæ.
19.46.54,73			54,78	27,39	32,61			19.47.27,44	$\beta$ Aquilæ.
22.56.15,51			15,57	48,27	32,70			22.56.48,36	$\alpha$ Pegasi.
23.2.26,82			26,85					23.2.59,65	Uranus.
11.25.8,79							32,84	11.26.46,04	☉'s center.
11.27.16,55			12,72						
17.4.51,24			51,23			1,03	33,89	17.5.25,85	$\gamma$ 1 L.
17.36.54,15			54,14					17.37.28,78	$p$ Sagittarii.
19.42.23,87			23,92	58,69	34,77			19.42.58,65	$\alpha$ Aquilæ.
19.46.52,58			52,63	27,37	34,74			19.47.27,37	$\beta$ Aquilæ.
20.8.35,90			35,92	10,63	34,71			20.9.10,68	$\alpha^2$ Capricorni.
13.1.29,76			29,78				34,92	13.2.5,26	Venus 1 L.
7.30.17,83			17,88	54,15	36,27	1,04	35,96	7.30.54,16	Procyon.

Error of Collimation = -0",73.

Level Error = +2",41. From Sept. 12 = +1",67.

Meridian Error from Sept. 12 by Polaris, Polaris SP, and Polaris Sept. 17 and 18.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Sept. 16	Pollux.....	7,7	23,0	37,8	53,5	8,8	24,0	7.35.39,4		C.
Sept. 17	$\alpha$ Pegasi.....	29,8	43,2	57,0	11,1	25,1	38,9	22.56.52,8		B.
	(a) $\delta$ Cephei.....	...	40,8	18,7	57,5	36,3	14,8	23.21.52,5	- 19,15	B.
	(a) $\gamma$ Cephei.....	19,8	18,3	15,7	15,8	13,6	13,3	23.34.....	+ 29,32	B.
	$\alpha$ Andromedæ.....	45,3	1,1	15,7	31,0	46,2	1,9	0.0.17,0		B.
	Polaris.....	36.53,6	45.14,3	53.22,4	1.51,8	10.8,7	18.30,2	1.26.50,3		B.
	(a) Regulus.....	...	...	...	11,8	25,1	39,0	9.59.52,7	- 20,73	B.
Sept. 18	Venus 1 L.....	39,9	53,5	7,2	21,3	35,3	49,1	13.1.3,1		B.
	Polaris SP.....	36.51,7	45.12,4	53.32,7	1.45,7	10.19,4	18.26,5	13.26.48,3		B.
	(a) Arcturus.....	0,2	14,4	...	43,1	57,1	11,8	14.8.....	+ 5,69	B.
	$h^2$ Sagittarii.....	35,7	50,4	5,2	20,2	34,9	50,1	19.27.5,1		B.
	$\alpha$ Aquilæ.....	40,1	53,6	7,1	20,9	34,3	48,1	19.43.1,6		B.
	59 Sagittarii.....	...	59,2	13,9	29,9	45,0	59,9	19.47.15,2	- 7,58	B.
	) 1 L..... (hazy)	1,9	16,9	31,9	47,8	3,1	18,2	19.59.33,6		B.
	$\alpha^2$ Capricorni.....	51,1	5,2	18,8	32,8	46,3	0,5	20.9.14,1		B.
	$\pi$ Capricorni.....	49,1	3,7	17,4	32,0	46,1	0,2	20.18.14,4		B.
	$\psi$ Capricorni.....	14,8	29,2	44,1	59,1	14,1	29,0	20.36.44,0		B.
	Polaris.....	36.52,6	45.9,2	53.21,3	1.48,3	10.5,8	18.26,7	1.26.47,4		B.
	Regulus.....	29,3	43,2	56,5	10,8	24,4	38,1	9.59.52,1		B.
	(b) Mercury 2 L.....	38,3	52,1	5,3	...	...	...	10.40.0,3	+ 10,28	B.
Sept. 19	☉ 1 L.....	20,3	33,8	47,1	0,8	14,6	27,8	11.43.41,3		B.
	☉ 2 L.....	28,5	42,1	55,3	9,0	22,4	36,1	11.45.49,8		B.
	) 1 L.....	53,3	8,3	23,0	38,0	53,0	7,7	20.56.22,3		B.
	$\beta$ Aquarii.....	49,1	2,4	16,2	29,5	43,1	56,2	21.23.10,1		B.
	$\gamma$ Capricorni.....	52,4	6,9	20,8	34,9	49,2	3,0	21.31.16,9		B.
	$\delta$ Capricorni.....	51,8	6,0	19,7	34,1	48,1	1,9	21.38.16,1		B.
	$\alpha$ Aquarii.....	15,1	29,0	42,2	55,7	9,1	22,1	21.57.36,0		B.
	$\alpha$ Pegasi.....	27,8	41,7	55,3	9,7	23,3	37,0	22.56.50,8		B.
	Uranus.....	47,7	1,2	14,4	28,1	41,9	55,2	23.2.8,9		B.
	$\alpha$ Andromedæ.....	43,2	58,9	14,0	29,3	44,9	59,9	0.0.15,0		B.
	Polaris.....	...	45.7,7	53.31,2	1.44,2	10.13,3	18.22,4	1.26.43,2	- 4.10,10	B.
	(c) Juno.....	38,9	52,7	6,4	20,1	33,3	47,0	1.37.0,2		B.
	(b) Mercury 2 L.....	9,7	23,5	37,3	50,6	...	18,3	10.44.31,7	+ 2,32	B.
Sept. 20	☉ 1 L..... (cloudy)	54,7	8,0	21,5	...	...	2,1	11.47.15,3	+ 2,73	B.
	☉ 2 L.....	...	16,3	30,0	43,4	57,0	10,4	11.49.23,9	- 6,75	B.
	Polaris SP.....	36.54,7	45.13,4	...	1.54,8	10.10,3	18.31,7	13.26.48,6	- 1.24,46	B.
	Arcturus.....	58,0	12,2	26,4	40,9	55,8	9,9	14.8.24,1		B.
	Polaris.....	36.40,3	...	53.23,5	1.39,3	10.13,2	18.18,6	1.26.42,2	- 2.46,55	B.
Sept. 21	$\alpha$ Ophiuchi.....	7,9	21,8	35,4	49,3	3,3	16,8	17.27.30,3		B.
	$\alpha$ Aquilæ.....	37,2	51,1	4,4	18,1	32,0	45,3	19.42.58,9		B.
	$\beta$ Aquilæ.....	6,1	19,4	32,9	46,4	0,2	13,9	19.47.27,2		B.
	$\alpha^2$ Capricorni.....	48,2	2,0	16,0	29,8	43,9	57,3	20.9.11,2		B.
	$\beta$ Aquarii.....	47,1	0,8	14,2	27,8	41,4	54,8	21.23.8,2		B.
	$\alpha$ Aquarii.....	12,9	26,8	40,1	53,9	7,9	20,8	21.57.34,1		B.
	$\theta$ Aquarii.....	2,1	15,7	29,3	43,1	56,8	10,1	22.8.23,9		B.
	$\sigma$ Aquarii.....	49,1	3,1	16,7	30,4	44,3	58,2	22.22.11,6		B.
	(d) ) 1 L.....	3,4	17,0	30,3	44,2	58,6	11,9	22.45.26,1		B.
	$\alpha$ Pegasi.....	26,1	39,9	53,3	7,3	21,4	35,2	22.56.49,0		B.
	Uranus.....	28,1	41,8	55,5	9,0	23,1	36,2	23.1.49,7		B.
	$\phi$ Aquarii.....	41,2	54,9	8,7	21,9	36,1	49,3	23.6.2,6		B.
	$\kappa^1$ Piscium.....	23,2	37,1	50,2	3,8	17,2	30,7	23.18.44,0		B.
	$\alpha$ Andromedæ.....	41,5	56,9	12,1	27,3	42,9	58,1	0.0.13,2		B.
	(e) Juno.....	7,1	20,3	34,0	...	...	...	1.36.27,8	+ 10,12	B.
Sept. 22	$\alpha$ Pegasi.....	25,0	38,7	52,8	6,3	20,8	34,2	22.56.48,0		B.
	$\phi$ Aquarii.....	40,4	53,9	7,8	21,0	34,9	48,1	23.6.1,9		B.

ILLUMINATED END OF AXIS EAST. Order of Wires for Stars above the Pole, *ABCDEFGH*.  
 From the Moon Sept. 19.....WEST.....*GFEDCBA*.  
 Transit reversed Sept. 19, 2<sup>h</sup>, and levelled just before and after the reversion.  
 Transit levelled Sept. 25, 2<sup>h</sup>.

(a) Cloudy. (b) Very cloudy.  
 (c) Wire V marked doubtful.

(d) Dazzling: not very good.  
 (e) Very cloudy and doubtful.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>''</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
7.34.53,45		+0,37	53,52	29,65	36,13	1,04	35,96	7.35.29,81	Pollux.
22.56.11,12			11,18	48,28	37,10			22.56.48,13	$\alpha$ Pegasi.
23.19.57,62			57,76					23.20.34,73	$\delta$ Cephei.
23.32.15,40			15,59					23.32.52,57	$\gamma$ Cephei.
23.59.31,17			31,24	8,24	37,00			0.0.8,24	$\alpha$ Andromedæ.
1.1.50,19	51,92		52,46	28,00	35,54		37,00	1.2.29,50	Polaris.
9.59.11,42			11,48	49,05	37,57	1,00	37,03	9.59.48,93	Regulus.
13.0.21,34			21,36					13.0.58,93	Venus 1 L.
13.1.50,96	49,38		49,96	28,14	38,18			1.2.27,53	Polaris SP.
14.7.43,01			43,07	20,61	37,54			14.8.20,69	Arcturus.
19.26.20,23			20,24					19.26.58,08	$h^2$ Sagittarii.
19.42.20,81			20,86	58,65	37,79			19.42.58,71	$\alpha$ Aquilæ.
19.46.29,60			29,59					19.47.7,45	59 Sagittarii.
19.58.47,63			47,64					19.59.25,50	$\eta$ 1 L.
20.8.32,68			32,70	10,60	37,90			20.9.10,57	$\alpha^2$ Capricorni.
20.17.31,84			31,85					20.18.9,72	$\pi$ Capricorni.
20.35.59,19			59,20					20.36.37,09	$\psi$ Capricorni.
1.1.47,33	49,06		48,52	28,27	39,75		38,03	1.2.26,59	Polaris.
9.59.10,62			10,68	49,07	38,39	0,88	37,92	9.59.48,97	Regulus.
10.39.19,28			19,33					10.39.57,64	Mercury 2 L.
11.43.0,81									
11.45.9,03			4,96					11.44.43,31	$\odot$ 's center.
20.55.37,95		+1,07	38,11					20.56.16,80	$\eta$ 1 L.
21.22.29,52			29,69	8,47	38,78			21.23.8,39	$\beta$ Aquarii.
21.30.34,87			35,04					21.31.13,75	$\gamma$ Capricorni.
21.37.33,96			34,13					21.38.12,84	$\delta$ Capricorni.
21.56.55,60			55,78	34,47	38,69			21.57.34,50	$\alpha$ Aquarii.
22.56.9,38			9,57	48,28	38,71			22.56.48,33	$\alpha$ Pegasi.
23.1.28,20			28,37					23.2.7,13	Uranus.
23.59.29,32			29,52	8,26	38,74			0.0.8,32	$\alpha$ Andromedæ.
1.1.46,90	51,66		50,09	28,50	38,41		38,80	1.2.28,93	Polaris.
1.36.19,80			19,98					1.36.58,84	Juno.
10.43.50,84			51,02			0,94	38,83	10.44.30,27	Mercury 2 L.
11.46.35,05									
11.48.43,42			39,42					11.48.18,71	$\odot$ 's center.
13.1.51,12	46,46		48,14	28,60	40,46			1.2.27,48	Polaris SP.
14.7.41,04			41,22	20,60	39,38			14.8.20,60	Arcturus.
1.1.42,97	47,73		46,16	28,69	42,53		39,70	1.2.25,97	Polaris.
17.26.49,26			49,44	29,97	40,53	0,92	39,73	17.27.29,84	$\alpha$ Ophiuchi.
19.42.18,15			18,33	58,61	40,28			19.42.58,81	$\alpha$ Aquilæ.
19.46.46,59			46,77	27,29	40,52			19.47.27,26	$\beta$ Aquilæ.
20.8.29,78			29,95	10,56	40,61			20.9.10,45	$\alpha^2$ Capricorni.
21.22.27,76			27,93	8,46	40,53			21.23.8,48	$\beta$ Aquarii.
21.56.53,79			53,97	34,46	40,49			21.57.34,54	$\alpha$ Aquarii.
22.7.43,00			43,17					22.8.23,75	$\theta$ Aquarii.
22.21.30,48			30,65					22.22.11,24	$\sigma$ Aquarii.
22.44.44,50			44,67					22.45.25,27	$\eta$ 1 L.
22.56.7,46			7,65	48,28	40,63			22.56.48,26	$\alpha$ Pegasi.
23.1.9,06			9,23					23.1.49,84	Uranus.
23.5.22,10			22,27					23.6.2,89	$\phi$ Aquarii.
23.18.3,74			3,92					23.18.44,54	$\kappa^1$ Piscium.
23.59.27,43			27,63	8,27	40,64			0.0.8,28	$\alpha$ Andromedæ.
1.35.47,42			47,60				40,65	1.36.28,31	Juno.
22.56.6,54			6,74	48,28	41,54	0,94	40,65	22.56.48,29	$\alpha$ Pegasi.
23.5.21,14			21,32					23.6.2,88	$\phi$ Aquarii.

Error of Collimation = - 0'',73. From the Moon Sept. 19 = + 0'',88.

Level Error = + 1'',67. From the Moon Sept. 19 = + 1'',40. From Sept. 22 = + 1'',62.

Meridian Error from the Moon Sept. 19 by Polaris, Polaris SP, and Polaris Sept. 19 and 20. By bisections of Grantchester cross at the reversion of Sept. 19, Meridian Error = + 1'',45.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Sept. 22	$\kappa^1$ Piscium.....	22,5	35,9	49,2	2,9	16,7	29,9	23.18.43,1		B.
	$\eta$ 1 L.....	28,4	42,1	56,0	9,7	23,8	37,3	23.38.51,1		B.
	$\omega$ Piscium.....	44,0	57,3	11,2	25,1	38,3	51,9	23.51.5,2		B.
	$\alpha$ Andromedæ.....	40,8	56,1	11,2	26,2	42,0	56,9	0.0.12,1		B.
	$d$ Piscium.....	0,4	14,1	27,4	41,0	54,9	8,1	0.12.21,8		B.
Sept. 23	(a) $\odot$ 1 L.....	.....	.....	.....	18,9	32,5	45,7	11.57.59,3	-20,24	B.
	(b) $\odot$ 2 L.....	46,8	.....	.....	26,9	.....	54,2	12.0.7,4	-6,70	B.
	Venus 1 L.....	25,0	38,9	52,8	.....	.....	.....	12.54. ....	+27,82	B.
	$\alpha$ Ophiuchi.....	6,1	20,0	33,6	47,4	1,7	15,1	17.27.28,8		B.
	$\alpha$ Aquilæ.....	35,1	48,9	2,7	16,1	30,0	43,1	19.42.57,0		B.
	$\beta$ Aquilæ.....	4,0	17,7	31,1	44,8	58,3	12,1	19.47.25,0		B.
	$\alpha^2$ Capricorni.....	46,3	59,9	14,1	28,0	42,1	55,3	20.9.9,1		B.
	$\beta$ Aquarii.....	45,0	58,7	12,2	25,7	39,3	52,9	21.23.6,2		B.
	$\alpha$ Aquarii.....	11,4	24,7	38,2	51,9	5,4	18,9	21.57.32,1		B.
	$\alpha$ Pegasi.....	23,9	37,9	51,7	5,6	19,9	34,1	22.56.47,2		B.
	Uranus.....	9,6	23,1	36,9	50,2	4,2	17,4	23.1.31,0		B.
	$\omega$ Piscium.....	43,1	56,8	10,3	24,0	37,7	51,1	23.51.4,7		B.
	$\alpha$ Andromedæ.....	39,5	55,1	10,1	25,4	41,0	55,9	0.0.11,1		B.
	$d$ Piscium.....	59,5	12,9	26,1	40,1	53,9	7,2	0.12.20,8		B.
	$\eta$ 2 L.....	54,1	7,7	21,1	35,1	49,0	2,7	0.35.16,9		B.
	$\epsilon$ Piscium.....	15,9	29,1	43,1	56,3	10,2	23,5	0.54.37,0		B.
	$\eta$ Piscium.....	31,7	45,7	59,5	13,3	27,8	41,3	1.22.55,2		B.
	(c) Juno.....	28,3	41,7	55,2	8,8	22,1	35,7	1.35.49,1		B.
Sept. 24	$\odot$ 1 L.....	13,1	26,4	40,0	53,3	7,3	20,5	12.1.34,0		B.
	$\odot$ 2 L.....	21,2	35,0	48,5	2,0	15,8	29,2	12.3.42,1		B.
Sept. 25	(d) Venus 1 L.....	26,0	40,0	53,6	8,0	21,9	35,4	12.52. ....	+6,93	B.
	Polaris SP.....	36.50,2	45.11,3	.....	1.47,7	10.7,2	.....	13.26.46,6	+1.38,53	B.
	Arcturus.....	53,3	7,8	22,1	36,2	50,8	5,0	14.8.19,0		B.
	$\alpha$ Aquilæ.....	33,4	47,2	0,7	14,2	28,1	41,3	19.42.55,1		B.
	$\beta$ Aquilæ.....	2,3	16,1	29,2	43,1	56,7	10,1	19.47.23,4		B.
	$\alpha^2$ Capricorni.....	44,9	59,1	13,0	26,2	40,1	54,2	20.9.7,8		B.
Sept. 26	$\odot$ 1 L.....	23,1	36,3	50,0	3,5	17,3	30,4	12.8.44,0		B.
	$\odot$ 2 L.....	31,9	45,1	58,8	12,0	26,0	39,1	12.10.52,4		B.
	Polaris SP.....	36.49,7	45.11,5	53.18,2	.....	.....	.....	13.26.47,6	+6.15,19	B.
	$\alpha^2$ Capricorni.....	43,7	57,3	11,2	25,2	39,1	52,7	20.9.6,4		B.
	$\beta$ Aquarii.....	42,0	55,9	9,4	23,1	37,1	49,9	21.23.3,8		B.
	$\alpha$ Aquarii.....	9,1	21,9	35,4	49,2	2,8	16,0	21.57.29,3		B.
	$\alpha$ Pegasi.....	21,0	34,8	49,1	3,2	16,8	30,4	22.56.44,3		B.
	Uranus..... (unsteady)	42,2	55,1	9,2	22,2	35,9	49,7	23.1.3,1		B.
	$\alpha$ Andromedæ.....	37,1	52,1	7,2	22,7	38,1	53,1	0.0.8,4		B.
	Polaris.....	36.39,8	45.1,8	53.21,7	1.38,3	10.6,2	18.19,3	1.26.35,5		B.
	Juno.....	19,0	32,9	46,2	59,4	13,2	26,0	1.34.39,9		B.
	Regulus.....	21,9	35,7	49,3	3,3	17,2	30,8	9.59.44,4		B.
	(e) Mercury 2 L.....	36,4	50,2	3,8	17,2	31,7	44,3	11.23. ....	+6,78	B.
Sept. 27	(e) $\odot$ 1 L.....	58,0	.....	25,3	38,9	52,3	6,0	12.12.19,1	-4,50	B.
	$\odot$ 2 L.....	6,7	20,3	33,7	47,1	0,8	14,1	12.14.27,5		B.
	$\alpha$ Aquilæ.....	31,2	45,2	58,9	12,3	26,1	39,4	19.42.53,2		B.
	$\beta$ Aquilæ.....	0,3	13,9	27,3	40,9	55,1	8,2	19.47.21,5		B.
	$\alpha^2$ Capricorni.....	42,8	56,4	10,1	24,1	38,1	51,7	20.9.5,5		B.
	Polaris.....	.....	45.1,4	53.19,8	1.38,2	10.6,6	18.17,3	1.26.38,2	-4.10,07	B.
	Juno.....	53,2	6,7	20,1	33,7	47,2	0,7	1.34.13,9		B.
Sept. 28	$\alpha$ Aquilæ.....	30,7	44,1	58,0	11,4	25,1	38,4	19.42.52,1		B.
	$\beta$ Aquilæ.....	59,4	12,9	26,4	40,1	54,1	7,0	19.47.20,4		B.
	$\alpha^2$ Capricorni.....	41,9	56,0	9,4	23,2	37,1	50,9	20.9.4,9		B.
	$\alpha$ Pegasi.....	19,1	33,0	46,9	1,2	15,1	29,0	22.56.42,5		B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.

(a) Very hazy and doubtful.

(b) Thick haze.

(d) Very cloudy and unsteady.

(c) Wire I was written down 38,3.

(e) Clouds and much motion.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
23.18.2,88 23.38.9,78 23.50.24,71 23.59.26,47 0.11.41,10		+ 1,07	3,07 9,96 24,90 26,68 41,29	8,27	41,59	0,94	40,65  41,59	23.18.44,63 23.38.51,54 23.51.6,48 0.0.8,27 0.12.22,89	$\kappa^1$ Piscium. $\gamma$ 1 L. $\omega$ Piscium. $\alpha$ Andromedæ. $d$ Piscium.
11.57.18,86 11.59.27,12 12.55.6,72 17.26.47,53 19.42.16,13 19.46.44,71 20.8.27,83 21.22.25,71 21.56.51,80 22.56.5,76 23.0.50,35 23.50.23,96 23.59.25,44 0.11.40,07 0.34.35,23 0.53.56,44 1.22.13,50 1.35.8,70			23,18 6,89 47,73 16,32 44,90 28,01 25,89 51,98 5,96 50,53 24,15 25,65 40,26 35,41 56,63 13,70 8,89	29,93 58,58 27,26 10,54 8,44 34,45 48,28	42,20 42,26 42,36 42,53 42,55 42,47 42,32	0,93	41,61  42,54	11.59.5,25 12.55.49,00 17.27.30,01 19.42.58,69 19.47.27,28 20.9.10,40 21.23.8,33 21.57.34,44 22.56.48,46 23.1.33,03 23.51.6,68 0.0.8,19 0.12.22,81 0.35.17,97 0.54.39,20 1.22.56,29 1.35.51,49	$\odot$ 's center. Venus 1 L. $\alpha$ Ophiuchi. $\alpha$ Aquilæ. $\beta$ Aquilæ. $\alpha^2$ Capricorni. $\beta$ Aquarii. $\alpha$ Aquarii. $\alpha$ Pegasi. Uranus. $\omega$ Piscium. $d$ Piscium. $\gamma$ 2 L. $\epsilon$ Piscium. $\eta$ Piscium. Juno.
12.0.53,51 12.3.1,97			57,93					12.2.40,93	$\odot$ 's center.
12.52.7,75 13.1.47,13 14.7.36,32 19.42.14,29 19.46.42,98 20.8.26,47		+ 1,38	7,94 44,21 36,53 14,49 43,19 26,66	29,85 20,56 58,55 27,23 10,52	45,64 44,03 44,06 44,04 43,86	0,96	43,26	12.52.51,71 1.2.27,99 14.8.20,35 19.42.58,54 19.47.27,24 20.9.10,73	Venus 1 L. Polaris SP. Arcturus. $\alpha$ Aquilæ. $\beta$ Aquilæ. $\alpha^2$ Capricorni.
12.8.3,51 12.10.12,18 13.1.46,94 20.8.25,09 21.22.23,03 21.56.49,10 22.56.2,80 23.0.22,48 23.59.22,67 1.1.40,37 1.33.59,52 9.59.3,23 11.23.17,38	41,86		8,04 44,02 25,28 23,23 49,29 3,01 22,68 22,89 43,55 59,72 3,44 17,59	30,20 10,50 8,42 34,44 48,28	46,18 45,22 45,19 45,15 45,27	1,03	44,80	12.9.52,86 1.2.28,88 20.9.10,44 21.23.8,45 21.57.34,53 22.56.48,30 23.1.7,97 0.0.8,22 1.2.28,92 1.34.45,10 9.59.49,14 11.24.3,34	$\odot$ 's center. Polaris SP. $\alpha^2$ Capricorni. $\beta$ Aquarii. $\alpha$ Aquarii. $\alpha$ Pegasi. Uranus. $\alpha$ Andromedæ. Polaris. Juno. Regulus. Mercury 2 L.
12.11.38,77 12.13.47,17 19.42.12,33 19.46.41,03 20.8.24,10 1.1.40,18 1.33.33,64	45,57		43,16 12,53 41,24 24,29 43,36 33,84	58,52 27,20 10,49 30,71	45,99 45,96 46,20 47,35	0,91	45,32	12.13.28,94 19.42.58,60 19.47.27,31 20.9.10,37 1.2.29,63 1.34.20,13	$\odot$ 's center. $\alpha$ Aquilæ. $\beta$ Aquilæ. $\alpha^2$ Capricorni. Polaris. Juno.
19.42.11,40 19.46.40,04 20.8.23,34 22.56.0,97			11,60 40,25 23,53 1,18	58,51 27,19 10,48 48,28	46,91 46,94 46,95 47,10	0,89	46,22	19.42.58,55 19.47.27,20 20.9.10,50 22.56.48,25	$\alpha$ Aquilæ. $\beta$ Aquilæ. $\alpha^2$ Capricorni. $\alpha$ Pegasi.

Error of Collimation = + 0'',88.

Level Error = + 1'',62.

Meridian Error from Sept. 25 by Polaris SP and Polaris Sept. 26, allowing + 0',65 for loss of clock, and - 0',17 for change of  $\mathcal{R}$ .



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Sept. 28	Uranus .....	23,4	37,0	50,8	4,2	17,8	31,2	23. 0. 44,9		B.
	$\alpha$ Andromedæ .....	35,1	50,2	5,9	21,1	36,3	51,3	0. 0. 6,7		B.
	Juno .....	26,2	40,1	53,1	6,7	20,0	33,5	1. 33. 47,1		B.
Sept. 29	$\gamma$ 2 L. ....	51,7	7,5	23,1	38,7	54,5	10,0	6. 50. 25,5		B.
	$\delta$ Geminorum .....	12,0	26,7	42,2	57,3	12,9	28,0	7. 15. 43,3		B.
	Castor .....	45,9	1,8	17,7	33,4	49,5	5,1	7. 24. 21,1		B.
	Procyon .....	25,4	39,0	52,4	6,1	19,8	32,8	7. 30. 46,6		B.
	Pollux .....	55,7	11,2	26,0	41,5	57,1	12,0	7. 35. 27,1		B.
	Regulus .....	18,9	32,9	46,7	0,8	14,5	28,2	9. 59. 41,8		B.
	Mercury 2 L. .... (hazy)	41,2	54,6	8,3	21,6	35,3	48,8	11. 43. 2,3		B.
Sept. 30	$\odot$ 1 L. .... (cloudy)	45,4	58,9	12,4	25,8	39,3	...	12. 22. ....	+ 13,48	B.
	Venus 1 L. ....	15,7	29,1	43,0	56,8	10,9	24,4	12. 43. 38,3		B.
	Polaris SP. ....	36.44,7	45. 5,8	53.16,6	1.43,5	10. 3,6	...	13. ....	+ 8. 20,12	B.
	$\alpha$ Aquilæ .....	29,1	42,1	56,1	9,3	23,2	36,5	19. 42. 50,0		B.
	$\beta$ Aquilæ .....	57,6	11,1	24,7	38,1	52,0	5,2	19. 47. 18,7		B.
	$\alpha^2$ Capricorni .....	39,9	54,0	7,7	21,3	35,4	49,1	20. 9. 3,1		B.
	$\alpha$ Pegasi .....	17,6	31,4	45,1	59,1	13,2	27,0	22. 56. 40,8		B.
	Uranus .....	6,0	19,2	32,7	46,2	0,3	13,8	23. 0. 27,1		B.
	$\alpha$ Andromedæ .....	33,2	48,9	3,9	19,2	34,9	50,2	0. 0. 4,9		B.
	Polaris .....	36.42,2	44.59,8	53.22,2	1.32,8	10. 7,5	...	1. 26. 40,4	+ 2. 46,22	B.
	(a) Juno .....	...	...	...	8,6	22,0	35,2	1. 32. 48,6	- 20,19	B.
	Procyon .....	24,9	38,1	51,9	5,3	19,1	33,0	7. 30. 45,9		B.
	Pollux .....	55,0	10,2	25,4	40,9	56,1	11,2	7. 35. 26,5		B.
	(b) $\gamma$ 2 L. ....	9,3	24,1	39,8	54,9	10,5	25,3	7. 51. 41,0		B.
Oct. 1	$\odot$ 2 L. ....	30,4	44,0	57,9	11,2	25,0	38,0	12. 28. 51,4		B.
	$\alpha$ Aquilæ .....	28,2	41,9	55,4	9,1	22,5	36,0	19. 42. 49,7		B.
	$\beta$ Aquilæ .....	57,0	10,5	24,1	37,7	51,3	4,6	19. 47. 18,1		B.
	$\beta$ Aquarii .....	38,1	51,7	5,0	18,8	32,4	45,8	21. 22. 59,4		B.
	Uranus .....	57,3	10,9	24,0	38,0	51,8	...	22. 59. ....	+ 13,54	B.
	$\alpha$ Andromedæ .....	32,7	48,2	3,4	18,5	34,1	49,1	0. 0. 4,2		B.
	Polaris .....	...	...	53.18,2	1.37,0	10. 5,8	18.15,2	1. 26. 34,4	- 8. 20,16	B.
Oct. 2	(c) $\odot$ 1 L. ....	58,1	11,9	25,2	38,8	52,5	5,8	12. 30. 19,2		B.
	$\odot$ 2 L. ....	7,1	20,9	34,1	47,5	1,3	14,4	12. 32. 27,6		B.
	(d) $\alpha$ Pegasi .....	16,1	29,9	43,4	57,4	11,4	25,2	22. 56. 39,2		B.
	Uranus .....	48,3	2,0	15,7	28,9	42,8	56,1	23. 0. 9,9		B.
	$\alpha$ Andromedæ .....	31,9	47,2	2,3	17,5	33,2	48,0	0. 0. 3,2		B.
	Polaris .....	36.38,5	44.57,7	53.17,6	1.35,3	10. 3,8	18.16,2	1. 26. 36,3		B.
	Juno .....	26,1	39,9	52,9	6,9	20,4	34,0	1. 31. 47,2		B.
	$\gamma$ 2 L. ....	49,0	3,0	17,4	31,9	46,1	0,2	9. 40. 14,7		B.
Oct. 3	$\beta$ Leonis .....	19,4	32,9	46,6	0,9	15,1	28,8	11. 40. 42,9		B.
	$\odot$ 1 L. ....	35,2	48,7	2,1	16,0	29,4	42,7	12. 33. 56,2		B.
	$\odot$ 2 L. ....	44,3	57,8	11,3	25,1	38,7	52,0	12. 36. 5,3		B.
	Arcturus .....	46,2	0,8	14,9	29,1	43,8	57,8	14. 8. 12,3		B.
Oct. 4	Polaris SP. .... (cloudy)	...	45. 7,9	53.13,5	1.38,7	...	18.22,6	13. ....	+ 2. 5,76	B.
Oct. 5	Arcturus .....	44,7	58,9	13,2	27,7	42,0	56,1	14. 8. 10,7		B.
Oct. 7	$\odot$ 1 L. ....	6,4	20,0	33,5	47,0	0,9	14,1	12. 48. 27,7		B.
	$\odot$ 2 L. ....	16,1	29,7	43,2	56,6	10,6	23,9	12. 50. 37,2		B.
	$\alpha$ Aquilæ .....	23,2	36,4	50,2	3,9	17,4	30,9	19. 42. 44,2		B.
	$\beta$ Aquilæ .....	51,8	5,2	18,8	32,2	45,8	59,1	19. 47. 13,0		B.
	$\alpha^2$ Capricorni .....	34,2	48,1	2,2	15,8	29,6	43,2	20. 8. 57,1		B.
	(e) * N.P.D. 26°. 38' .....	...	15,7	44,9	15,3	45,2	14,8	20. 24. 44,5	- 15,00	B.
	$\delta$ Cephei .....	29,1	1,7	33,3	6,0	39,1	10,5	22. 44. 42,4		B.
	$\alpha$ Pegasi .....	12,1	25,7	39,3	53,3	7,4	21,1	22. 56. 35,1		B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.  
Transit levelled Oct. 2, 22<sup>h</sup> and Oct. 9, 2<sup>h</sup>.

(a) Confused by a star similar in size and very near; probably an error of 1" in counting. The observation as set down has been diminished 1<sup>m</sup>.

(b) Much motion.  
(d) Flaring, confused.  
(e) Exceedingly faint.

(c) Cloudy and faint.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
23. 0. 4,19 23. 59. 20,94 1. 33. 6,67		+ 1,38	4,39 21,16 6,86	8,31	47,15	0,89	46,22 47,11	23. 0. 51,46 0. 0. 8,27 1. 33. 54,03	Uranus. $\alpha$ Andromedæ. Juno.
6. 49. 38,72 7. 14. 57,49 7. 23. 33,50 7. 30. 6,01 7. 34. 41,51 9. 59. 0,54 11. 42. 21,73		+ 2,35	38,97 57,73 33,73 6,25 41,75 0,78 21,98			0,75	48,10	6. 50. 27,28 7. 15. 46,06 7. 24. 22,06 7. 30. 54,58 7. 35. 30,09 9. 59. 49,19 11. 43. 10,45	$\gamma$ 2 L. $\iota$ Geminorum. Castor. Procyon. Pollux. Regulus. Mercury 2 L.
12. 22. 25,84 12. 42. 56,89 13. 1. 42,96 19. 42. 9,48 19. 45. 38,20 20. 8. 21,50 22. 55. 59,18 22. 59. 46,47 23. 59. 19,32 1. 1. 40,37 1. 32. 8,41 7. 30. 5,46 7. 34. 40,75 7. 50. 54,99	38,28		26,08 57,14 41,96 9,72 38,44 21,74 59,42 46,72 19,56 41,72 8,66 5,70 40,99 55,23	31,33 58,48 27,16 10,45 48,27	49,37 48,76 48,72 48,74 48,85			12. 23. 14,57 12. 43. 45,64 1. 2. 30,47 19. 42. 58,44 19. 47. 27,16 20. 9. 10,47 22. 56. 48,24 23. 0. 35,54 0. 0. 8,41 1. 2. 30,60 1. 32. 57,56 7. 30. 54,64 7. 35. 29,93 7. 51. 44,18	$\odot$ 1 L. Venus 1 L. Polaris SP. $\alpha$ Aquilæ. $\beta$ Aquilæ. $\alpha^2$ Capricorni. $\alpha$ Pegasi. Uranus. $\alpha$ Andromedæ. Polaris. Juno. Procyon. Pollux. $\gamma$ 2 L.
12. 28. 11,13 19. 42. 8,97 19. 46. 37,62 21. 22. 18,75 22. 59. 37,94 23. 59. 18,60 1. 1. 37,96	45,15		11,37 9,21 37,86 19,00 38,19 18,84 39,31	58,46 27,14 8,38	49,25 49,28 49,38			12. 29. 0,46 19. 42. 58,53 19. 47. 27,18 21. 23. 8,37 23. 0. 27,61 0. 0. 8,29 1. 2. 28,79	$\odot$ 2 L. $\alpha$ Aquilæ. $\beta$ Aquilæ. $\beta$ Aquarii. Uranus. $\alpha$ Andromedæ. Polaris.
12. 29. 38,79 12. 31. 47,56 22. 55. 57,52 22. 59. 29,10 23. 59. 17,62 1. 1. 37,91 1. 31. 6,77 9. 39. 31,75 11. 40. 0,94		+ 1,59	43,38 57,73 29,30 17,84 40,37 6,98 31,96 1,15	48,27 8,32 31,59	50,54 50,48 51,22	0,95	49,58	12. 31. 33,46 22. 56. 48,22 23. 0. 19,79 0. 0. 8,37 1. 2. 30,94 1. 31. 57,57 9. 40. 22,83 11. 40. 52,09	$\odot$ 's center. $\alpha$ Pegasi. Uranus. $\alpha$ Andromedæ. Polaris. Juno. $\gamma$ 2 L. $\beta$ Leonis.
12. 33. 15,76 12. 35. 24,93 14. 7. 29,28			20,55 29,48	20,52	51,04			12. 35. 11,52 14. 8. 20,50	$\odot$ 's center. Arcturus.
13. 1. 41,43 14. 7. 27,62	36,75		39,24 27,82	31,69 20,51	52,45 52,69	0,83	51,37 52,20	1. 2. 31,06 14. 8. 20,51	Polaris SP. Arcturus.
12. 47. 47,09 12. 49. 56,76 19. 42. 3,74 19. 46. 32,27 20. 8. 15,74 20. 23. 15,07 22. 43. 6,02 22. 55. 53,43			52,13 3,94 32,48 15,94 15,38 6,33 53,64	58,37 27,05 10,34	54,43 54,57 54,40	0,85	53,77	12. 49. 46,35 19. 42. 58,41 19. 47. 26,95 20. 9. 10,42 20. 24. 9,87 22. 44. 0,90 22. 56. 48,22	$\odot$ 's center. $\alpha$ Aquilæ. $\beta$ Aquilæ. $\alpha^2$ Capricorni. * N.P.D. 26°. 38'. $\iota$ Cephei. $\alpha$ Pegasi.

Error of Collimation = + 0'',88.

Level Error = + 1'',62. From Sept. 29 = + 1'',41. From Oct. 7 = + 1'',48.

Meridian Error from Sept. 29 by Polaris SP and Polaris Sept. 30, allowing + 0'',30 for loss of clock, and - 0'',07 for change of  $\mathcal{R}$ .Meridian Error from Oct. 2 by Polaris Oct. 2 and Polaris SP Oct. 4, allowing + 1'',23 for loss of clock, and - 0'',10 for change of  $\mathcal{R}$ .



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Oct. 7	Uranus.....	6,4	20,1	33,8	47,2	0,9	14,2	22. 59. 27,9		B.
	♄ Cephei.....	43,9	22,2	0,5	39,0	18,2	55,8	23. 21. 34,4		B.
	γ Cephei.....	0,9	59,7	58,4	56,7	56,9	54,2	23. 34. 53,1		B.
	* N.P.D. 25°. 26'.....	13,9	45,5	16,7	47,9	18,9	50,6	23. 54. 21,9		B.
	β Cassiopeiæ.....	29,6	55,2	20,9	46,3	12,7	37,3	0. 1. 3,1		B.
	κ Cassiopeiæ.....	37,3	6,1	34,3	3,4	32,2	0,7	0. 24. 29,3		B.
	Polaris..... (blazing)	36.28,3	44.49,4	53.11,4	1.31,2	10. 3,2	....	1. 26. 34,3	+ 2. 46,50	B.
	* N.P.D. 33°. 32'.....	47,2	11,7	36,1	0,3	25,0	48,9	1. 18. 13,9		B.
Oct. 9	☉ 2 L..... (very cloudy)	34,0	....	....	14,9	28,6	42,0	12. 57. 55,3	- 8,15	B.
	α Ophiuchi.....	51,9	5,7	19,7	33,2	47,2	0,8	17. 27. 14,6		B.
Oct. 10	☉ 1 L.}..... (cloudy)	3,8	17,2	31,0	44,5	58,2	11,7	12. 59. 25,1		B.
	☉ 2 L.}.....	13,7	27,1	40,9	....	8,1	21,4	13. 1. 34,9	+ 0,01	B.
	α Ophiuchi.....	50,8	4,7	18,5	32,2	46,4	59,7	17. 27. 13,8		B.
	α Aquilæ.....	20,1	33,7	47,3	1,2	15,0	28,2	19. 42. 41,9		B.
	β Aquilæ.....	49,1	2,8	16,1	29,6	43,1	56,7	19. 47. 10,2		B.
	(a) * N.P.D. 25°. 0'.....	50,4	21,7	53,9	25,5	57,8	29,2	21. 3. 1,9		B.
	(b) * N.P.D. 75°. 23'.....	25,8	40,2	....	8,9	23,0	36,5	21. 19. 50,3	- 2,32	B.
	(b) * N.P.D. 24°. 20'.....	....	....	33.56,3	....	35. 2,4	35.34,2	22. 36. 6,9	- 40,86	B.
	Uranus.....	42,2	55,9	9,7	23,0	36,9	50,2	22. 59. 3,9		B.
	* N.P.D. 26°. 42'.....	43,9	13,7	43,4	13,3	44,1	13,3	23. 58. 43,2		B.
	κ Cassiopeiæ.....	34,5	3,2	31,9	0,7	29,9	57,9	0. 24. 26,5		B.
	Polaris.....	36.24,2	44.46,2	53. 6,8	1.26,3	9.55,0	18. 5,3	1. 26. 26,6		B.
	Venus 2 L.....	53,0	6,7	20,3	34,2	48,0	1,3	12. 21. 14,9		B.
	(c) Polaris SP.....	36.41,2	45. 1,4	....	1.41,6	9.59,8	18.18,8	13. 26. 40,5	- 1. 24,58	B.
	☉ 1 L.}..... (very cloudy)	....	....	....	24,0	38,0	51,2	13. 3. 5,0	- 20,40	B.
	☉ 2 L.}.....	53,8	7,1	20,9	34,1	48,0	1,3	13. 5. 14,9		B.
	Arcturus.....	39,1	53,3	7,9	22,2	36,8	50,9	14. 8. 5,1		B.
	α Aquilæ.....	19,1	33,0	46,2	0,1	13,8	27,2	19. 42. 40,7		B.
Oct. 11	(d) α² Capricorni.....	30,2	44,2	58,4	12,3	26,1	39,4	20. 8. 53,4		B.
	(d) Juno.....	2,1	15,8	29,5	....	56,3	9,5	1. 26. 23,2	+ 0,01	B.
	α Arietis.....	28,2	42,7	57,0	11,8	26,7	41,1	1. 57. 55,4		B.
	Venus 2 L.....	8,3	21,9	35,6	49,2	3,2	16,6	12. 19. 30,1		B.
	- Polaris SP.....	36.38,8	45. 1,2	....	1.38,7	9.57,4	18.17,2	13. 26. 38,5	- 1. 24,59	B.
Oct. 12	☉ 1 L.....	24,0	37,5	51,1	4,8	18,5	31,7	13. 6. 45,4		B.
	☉ 2 L.....	34,0	47,5	1,3	14,8	28,6	42,0	13. 8. 55,6		B.
	α Aquilæ.....	18,1	31,5	45,0	59,0	13,1	26,2	19. 42. 39,5		B.
Oct. 13	Venus 2 L.....	57,9	11,8	25,3	39,0	52,8	6,2	12. 16. 19,7		B.
	Polaris SP.....	36.35,3	44.53,2	....	1.35,7	9.54,4	18.15,2	13. 26. 34,6	- 1. 24,60	B.
Oct. 14	☉ 1 L.....	45,8	59,8	13,2	26,8	40,8	54,7	13. 14. 7,9		B.
	☉ 2 L.....	56,4	10,1	23,7	37,2	51,1	4,7	13. 16. 18,1		B.
	α Ophiuchi.....	46,7	0,8	14,4	28,1	42,0	55,5	17. 27. 9,4		B.
	(e) ☽ 1 L.....	2,1	18,0	33,7	49,4	6,0	21,1	18. 37. 37,1		B.
	h² Sagittarii.....	11,4	26,1	41,0	56,2	11,1	25,8	19. 26. 40,9		B.
	α Aquilæ.....	16,0	29,8	43,3	57,1	10,8	24,1	19. 42. 37,5		B.
	β Aquilæ.....	44,8	58,3	12,1	25,3	39,1	52,5	19. 47. 6,0		B.
	α² Capricorni... (cloudy)	....	....	55,2	8,8	22,9	36,3	20. 8. 50,2	- 13,83	B.
	(f) * N.P.D. 26°. 38'.....	36,2	8,5	38,5	8,3	38,4	8,6	20. 24. 37,7		B.
	(f) * N.P.D. 25°. 0'.....	....	17,8	....	20,6	53,1	24,9	21. 2. 57,2	- 25,45	B.
	(f) * N.P.D. 75°. 23'.....	....	36,4	51,0	5,0	19,0	32,4	21. 19. 47,6	- 6,95	B.
	(f) * N.P.D. 24°. 20'.....	....	....	....	25,0	58,3	29,8	22. 36. 3,3	- 49,01	B.
	Uranus..... (hazy)	13,0	26,2	39,9	53,4	6,3	19,2	22. 58. 33,1		B.
	* N.P.D. 25°. 26'.....	7,7	58,8	10,1	41,9	13,3	43,7	23. 54. 15,2		B.
	* N.P.D. 26°. 42'.....	41,3	9,9	39,7	9,5	40,1	9,3	23. 58. 39,2		B.
	κ Cassiopeiæ.....	30,7	59,1	27,9	56,4	25,9	54,0	0. 24. 22,9		B.
	Polaris.....	36.22,8	44.43,5	53. 4,2	1.24,2	9.53,4	....	1.....	+ 8. 19,44	B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, *GFEDCBA*.  
The Transit levelled Oct. 16, 2<sup>h</sup>.

(a) Very faint. A following star crossed wire VII at 21. 3. 18,8 by Hardy, and is probably the star observed with Encke's Comet in 1838. See April 10. (b) Stars of about the 9th magnitude: extremely faint.  
(c) Wire IV doubtful: it was written down 51,6 and is altered by a consideration of the intervals. (d) Doubtful, so very cloudy. (e) Cloudy and faint. (f) These small stars all very faint. A star passed wire VII at 21. 3. 13,8, the same that was observed at the same wire on Oct. 10.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
22.58.47,22 23.19.39,15 23.31.57,13 23.52.47,92 23.59.46,44 0.23.3,33 1.1.32,60 1.17.0,44		+ 1,59	47,42 39,50 57,59 48,23 46,72 3,62 35,20 0,72			0,85	53,77	22.59.42,00 23.20.34,10 23.32.52,19 23.53.42,85 0.0.41,34 0.23.58,25 1.2.29,86 1.17.55,39	Uranus. s Cephei. γ Cephei. * N.P.D. 25°.26'. β Cassiopeia. κ Cassiopeia. Polaris. * N.P.D. 33°.32'.
12.57.14,81 17.26.33,30		- 0,93	14,87 33,40	32,00 29,66	56,80 56,26	0,92	55,59	12.58.10,96 17.27.29,66	⊙ 2 L. α Ophiuchi.
12.58.44,50 13.0.54,36 17.26.32,30 19.42.1,05 19.46.29,66 21.1.25,77 21.19.8,46 22.34.29,09 22.58.23,11 23.57.13,56 0.23.0,65 1.1.27,20 12.20.34,06 13.1.39,30			49,49 32,40 1,14 29,75 26,17 8,56 29,50 23,17 13,94 1,00 33,48 34,11 33,03	29,65 58,32 27,00	57,25 57,18 57,25	0,97	56,46	13.0.46,47 17.27.29,56 19.42.58,39 19.47.27,01 21.2.23,48 21.20.5,88 22.35.26,87 22.59.20,56 23.58.11,37 0.23.58,44 1.2.30,95 12.21.32,13 1.2.31,08	⊙'s center. α Ophiuchi. α Aquilæ. β Aquilæ. * N.P.D. 25°.0'. * N.P.D. 75°.23'. * N.P.D. 24°.20'. Uranus. * N.P.D. 26°.42'. κ Cassiopeia. Polaris. Venus 2 L. Polaris SP.
13.2.24,15 13.4.34,30 14.7.22,18 19.42.0,01 20.8.12,00 1.25.42,74 1.57.11,84 12.18.49,28 13.1.37,38	32,12 34,49		29,29 22,29 0,10 12,04 42,80 11,96 49,33 31,11	20,50 58,30 10,28	58,21 58,20 58,24	1,03	57,49	13.4.27,34 14.8.20,39 19.42.58,43 20.9.10,39 1.26.41,38 1.58.10,56 12.19.48,31 1.2.30,12	⊙'s center. Arcturus. α Aquilæ. α² Capricorni. Juno. α Arietis. Venus 2 L. Polaris SP.
13.6.4,71 13.8.14,83 19.41.58,92			9,83 59,01	58,29	59,28	0,96	58,49	13.8.8,84 19.42.58,29	⊙'s center. α Aquilæ.
12.15.38,96 13.1.33,47	30,15	- 0,44	39,01 29,46	32,84	63,38	0,90	60,63	12.16.40,10 1.2.30,58	Venus 2 L. Polaris SP.
13.13.27,00 13.15.37,33 17.26.28,13 18.36.49,63 19.25.56,07 19.41.56,94 19.46.25,44 20.8.8,85 20.23.8,03 21.1.21,27 21.19.4,95 22.34.25,09 22.57.53,01 23.52.41,53 23.57.9,86 0.22.56,70 1.1.25,06			32,22 28,21 49,68 56,12 57,01 25,51 8,90 8,27 21,54 5,03 25,36 53,06 41,79 10,10 56,93 29,07	29,59 58,25 26,93 10,24	61,38 61,24 61,42 61,34		61,53	13.15.33,35 17.27.29,49 18.37.51,01 19.26.57,48 19.42.58,38 19.47.26,88 20.9.10,29 20.24.9,67 21.2.22,96 21.20.6,46 22.35.26,84 22.58.54,55 23.53.43,32 23.58.11,63 0.23.58,48 1.2.30,64	⊙'s center. α Ophiuchi. ⊙ 1 L. h² Sagittarii. α Aquilæ. β Aquilæ. α² Capricorni. * N.P.D. 26°.38'. * N.P.D. 25°.0'. * N.P.D. 75°.23'. * N.P.D. 24°.20'. Uranus. * N.P.D. 25°.26'. * N.P.D. 26°.42'. κ Cassiopeia. Polaris.

Error of Collimation = + 0'',88.

Level Error = + 1'',48. From Oct. 13 = + 0'',70.

Meridian Error from Oct. 9 by Polaris and Polaris SP Oct. 10, allowing + 0'',52 for loss of clock and - 0'',08 for change of R.

Meridian Error from Oct. 13 by Polaris SP Oct. 13 and Polaris Oct. 14, allowing + 0'',39 for loss of clock, and - 0'',01 for change of R.



Month and Day.	NAME OF STAR OR PLANET, and Circumstances of Observation.	I.		II.		III.		IV.		V.		VI.		VII. Wire.			Correction to Mean of Wires Observed.	Observer.
		m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	h.	m.	s.		
Oct. 14	(a) * N.P.D. 33°. 28'.....	6,4		30,3		54,9		19,1		43,9		8,3		1. 17. 32,2				B.
	(b) Juno.....	3,9		17,9		30,7		44,4		58,3		11,7		1. 24. 25,2				B.
Oct. 15	(c) 1 L.....	58,0		13,4		28,8		44,1		59,9		15,0		19. 34. 30,6				B.
	α Aquilæ..... (blazing)	15,3		28,9		42,7		56,2		10,1		23,1		19. 42. 36,9				B.
	β Aquilæ.....	44,1		57,7		11,1		24,5		38,2		51,8		19. 47. 5,2				B.
	(d) c Sagittarii.....	0,4		16,2		30,9		46,2		2,0		16,9		19. 52. 32,2				B.
	σ Capricorni.....	24,1		38,2		52,9		7,1		21,2		35,3		20. 9. 50,0				B.
	(e) * N.P.D. 25°. 0'.....	43,9		15,6		47,8		20,2		53,4		24,2		21. 2. 56,1				B.
	* N.P.D. 75°. 23'. (very faint)	...		36,2		50,0		4,3		18,9		32,9		21. 19. ....		+ 0,02		B.
	* N.P.D. 24°. 20'.....	46,2		18,9		52,2		24,1		57,3		29,1		22. 36. 2,0				B.
	Uranus.....	4,4		18,0		31,4		45,0		59,2		12,2		22. 58. 25,8				B.
	* N.P.D. 26°. 42'.....	39,1		9,1		38,9		8,7		39,3		8,9		23. 58. 38,4				B.
	(f) A.S.C. 55.....	21,2		36,0		51,1		6,4		21,2		36,1		0. 28. 50,9				B.
	Polaris.....	36.22,2		44.44,6		53. 5,4		1.24,3		9.51,5		...		1. ....		+ 8. 19,47		B.
	* N.P.D. 33°. 32'.....	40,1		4,7		28,9		52,9		17,8		41,2		1. 18. 6,4				B.
	Juno.....	24,3		38,1		51,2		5,0		18,8		32,1		1. 23. 45,3				B.
	(g) β Leonis.....	...		...		...		49,6		4,0		17,4		11. 41. 31,3		- 20,96		B.
	Venus 2 L.....	16,9		30,4		44,1		57,6		11,5		24,8		12. 14. 38,3				B.
	(h) Polaris SP.....	37.33,6		45.53,2		54. 5,7		2.39,2		...		...		13. ....		+ 12. 30,88		B.
Oct. 16	⊙ 1 L.}..... (much motion)	9,8		23,3		37,1		50,9		4,7		18,1		13. 22. 31,8				B.
	⊙ 2 L.}	20,9		34,4		48,2		2,0		15,9		29,1		13. 24. 42,9				B.
	Arcturus.....	34,6		49,0		3,4		17,9		32,1		46,1		14. 9. 0,4				B.
	α Ophiuchi.....	45,0		58,9		12,8		26,4		40,8		54,1		17. 28. 7,7				B.
	α Aquilæ.....	14,3		28,2		41,6		55,2		9,1		22,3		19. 43. 36,0				B.
	β Aquilæ.....	43,1		56,8		10,3		24,0		37,6		50,9		19. 48. 4,3				B.
	c Sagittarii.....	59,7		15,1		30,1		45,4		0,9		15,9		19. 53. 31,0				B.
	σ Capricorni.....	23,8		38,0		51,9		6,2		20,7		34,9		20. 10. 49,2				B.
	1 L.....	50,0		5,0		19,8		34,9		50,1		5,0		20. 31. 20,0				B.
	η Capricorni.....	31,7		46,1		0,4		14,9		29,4		43,5		20. 55. 57,9				B.
	s Capricorni.....	8,5		22,1		36,6		50,7		4,8		18,3		21. 7. 32,4				B.
	Uranus.....	57,1		10,7		24,3		37,9		51,6		5,1		22. 59. 18,5				B.
	* N.P.D. 25°. 26'.....	...		37,2		8,3		39,8		11,8		42,2		23. 55. 13,8		- 15,67		B.
	(i) A.S.C. 55.....	19,4		36,0		50,4		5,2		20,3		34,9		0. 29. 50,0				B.
	Polaris.....	37.20,4		45.42,2		54. 5,4		2.23,8		10.54,2		19. 3,5		1. 27. 25,8				B.
	Juno.....	45,0		58,4		12,1		25,4		39,1		52,2		1. 24. 6,1				B.
	(k) Venus 2 L.....	8,8		21,8		35,3		48,8		3,0		16,1		12. 13. 29,6				B.
	Polaris SP..... (cloudy)	...		...		54. 2,8		2.31,6		10.51,8		19.11,5		13. ....		- 4. 8,80		B.
Oct. 17	(k) ⊙ 1 L.....	53,6		7,1		21,0		34,6		48,5		2,1		13. 26. 15,7				B.
	⊙ 2 L.....	4,9		18,2		32,0		46,1		59,7		13,0		13. 28. 26,5				B.
	Arcturus.....	34,0		47,9		2,7		16,9		31,4		45,3		14. 8. 59,9				B.
Oct. 18	α Aquilæ.....	12,8		26,5		40,1		53,6		7,5		21,1		19. 43. 34,3				B.
	β Aquilæ.....	41,8		55,1		8,8		22,2		36,1		49,0		19. 48. 2,9				B.
	α² Capricorni.....	24,1		37,8		51,9		5,9		19,7		33,1		20. 9. 47,0				B.
	β Aquarii.....	23,1		36,3		50,1		3,9		17,2		30,6		21. 23. 44,1				B.
	δ Capricorni.....	25,8		39,8		54,1		8,2		22,2		36,1		21. 38. 50,2				B.
	1 L.....	20,4		34,6		48,4		3,0		17,2		31,1		22. 18. 45,2				B.
Oct. 19	α² Capricorni.....	23,1		37,2		50,9		4,4		18,7		32,2		20. 9. 46,0				B.
	β Aquarii.....	22,1		35,5		48,9		2,3		15,6		29,5		21. 23. 43,1				B.
	α Aquarii.....	48,2		1,8		15,3		28,6		42,1		55,3		21. 58. 9,0				B.
	λ Aquarii.....	30,1		43,6		57,2		11,1		24,9		38,1		22. 44. 51,5				B.
	Uranus.....	36,8		50,2		3,9		17,3		31,2		44,1		22. 58. 58,2				B.
	1 L.....	57,3		10,9		24,8		39,0		53,0		6,3		23. 11. 20,2				B.
	λ Piscium.....	7,7		21,0		34,3		47,9		1,9		14,8		23. 34. 28,2				B.
	γ Piscium.....	52,1		5,8		19,2		32,9		46,1		59,2		23. 54. 13,1				B.
	α Andromedæ... (blazing)	17,2		32,1		47,2		2,6		18,2		33,1		0. 0. 48,2				B.
	A.S.C. 55.....	18,0		32,9		47,7		2,9		18,2		32,2		0. 29. 47,3				B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.  
After the observation of Juno Oct. 15 the clock was put forward 1<sup>m</sup>.

- (a) A star passed Wire VII at 1. 18. 7,1, which is the one observed Oct. 7. (b) The first two intervals are bad. (c) Cloudy and very unsteady. (d) Cloudy. Wire V was written down 3,0 and has been altered conjecturally. (e) The star observed April 10 passed Wire VII at 21. 3. 13,7. (f) Faint and unsteady. (g) Hurried. (h) Wires V, VI, and VII, being evidently erroneous, were rejected. (i) Wire I was written down 20,4 and is altered conjecturally. (k) Very badly defined.





Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Oct. 19	A.S.C. 91.....(unsteady)	...	...	45.14,3	48. 1,9	50.53,3	53.36,8	0.56.25,2	- 2.47,28	B.
	Juno.....	46,0	59,9	13,2	26,7	40,7	53,9	1.22. 7,2		B.
	$\alpha$ Arietis.....	21,2	36,0	50,8	5,1	19,9	34,2	1.58.48,9		B.
Oct. 20	(a) $\alpha$ Pegasi.....	0,7	14,2	28,2	42,1	56,2	9,8	22.57.23,7	B.	B.
	$\lambda$ Piscium.....	7,3	20,8	34,0	47,7	1,1	14,2	23.34.27,8		B.
	(b) $\gamma$ 1 L.....	11,3	25,4	38,0	52,7	6,6	20,4	0. 4.34,2		B.
Oct. 24	$\eta$ Tauri.....	6,2	20,4	35,3	50,3	5,0	19,2	3.38.33,8	B.	B.
	A' Tauri.....	22,5	36,9	51,2	5,9	20,3	34,2	3.55.48,8		B.
	$\gamma$ 2 L..... (rugged)	33,9	49,4	5,0	20,3	36,0	51,2	4.10. 7,0		B.
	Aldebaran.....	53,3	7,4	21,1	35,7	50,1	3,9	4.27.17,4		B.
	$\tau$ Tauri.....	45,9	0,4	15,2	29,4	44,2	58,5	4.33.13,1		B.
	$\iota$ Tauri.....	39,3	54,2	8,2	23,0	37,2	51,4	4.54. 6,2		B.
Oct. 25	Venus 2 L.....	21,9	35,4	49,0	2,7	16,4	29,5	12. 9.43,1	+ 1.40,43	B.
	Polaris SP.....	37.21,3	45.44,3	53.54,5	...	...	19. 4,8	13.27.27,3		B.
Oct. 26	(c) $\odot$ 1 L.....	...	3,7	17,1	30,9	44,9	58,3	14. 0.12,4	- 6,91 - 0,05 - 5,75	B.
	$\odot$ 2 L.....	2,4	16,0	...	...	...	11,3	14. 2.24,9		B.
	(d) Arcturus.....	26,5	...	55,1	...	23,9	37,8	14. 8.52,1		B.
	$\alpha$ Aquilæ..... (blazing)	6,1	19,7	33,2	47,4	1,2	14,4	19.43.28,1		B.
	$\beta$ Aquilæ.....	34,9	48,3	1,9	15,4	29,1	42,3	19.47.56,2		B.
	$\alpha^s$ Capricorni.....	17,4	31,3	45,1	59,0	12,9	26,3	20. 9.39,9		B.
	Polaris...	37.15,7	45.39,6	53.58,7	2.17,5	10.47,6	18.58,4	1.27.19,5		B.
	(e) Juno.....	22,8	36,7	50,2	3,8	17,7	31,1	1.17.44,8		B.
	$\alpha$ Arietis.....	15,7	30,4	44,9	59,3	14,4	28,3	1.58.43,2		B.
	(f) Venus 2 L.....	9,5	23,0	36,5	50,1	4,1	...	12.10.....		B.
	Polaris SP.....	37.19,2	...	53.51,8	2.21,5	10.39,8	19. 0,3	13.27.22,6		B.
Oct. 28	Uranus.....	42,9	56,6	10,2	23,5	37,2	50,9	22.58. 4,2	- 6,99	B.
	$\alpha$ Andromedæ.....	10,2	24,9	40,1	55,2	11,1	26,2	0. 0.41,1		B.
	Polaris.....	37.14,2	45.35,8	53.57,3	2.14,6	10.45,4	18.57,7	1.27.19,7		B.
	Juno.....	12,1	25,6	39,3	52,7	6,8	19,3	1.16.33,2		B.
	$\alpha$ Arietis.....	14,2	28,7	43,1	57,8	13,1	27,0	1.58.41,4		B.
	$\beta$ Leonis.....	...	11,3	25,1	39,1	53,3	7,1	11.41.20,9		B.
Oct. 29	$\alpha$ Aquilæ.....	4,1	17,3	30,9	44,2	58,0	11,9	19.43.25,1	+ 0,70	B.
	$\beta$ Aquilæ.....	32,4	45,9	59,4	12,8	27,1	40,2	19.47.54,0		B.
	$\alpha$ Aquarii.....	40,0	53,4	7,1	20,4	34,1	47,2	21.58. 1,0		B.
	Polaris SP.....	37.15,6	...	...	...	10.38,3	18.57,5	13.....		B.
	Arcturus.....	23,4	37,9	52,1	6,4	21,1	35,1	14. 8.49,2		B.
Oct. 30	$\odot$ 1 L.....	12,8	26,7	40,4	54,5	8,6	22,1	14.15.36,1	+ 3,35	B.
	$\odot$ 2 L..... (hazy)	26,1	40,1	54,0	8,0	22,1	35,7	14.17.49,8		B.
	$\alpha$ Ophiuchi.....	34,0	47,7	1,7	15,3	29,1	42,8	17.27.56,5		B.
	$\alpha$ Aquilæ.....	3,1	16,5	30,1	44,0	57,7	11,1	19.43.24,4		B.
	$\beta$ Aquilæ..... (cloudy)	32,0	...	58,8	...	26,3	39,8	19.47.....		B.
Nov. 4	(g) $\odot$ 1 L.....	...	...	...	26,3	40,8	54,9	14.35. 8,6	- 21,00 - 22,47	B.
	$\odot$ 2 L.....	59,2	13,2	27,1	41,3	55,2	9,0	14.37.23,0		B.
	Mercury 1 L.....	19,0	33,3	47,9	2,2	16,8	30,9	15.21.45,1		B.
	$\alpha$ Coronæ Borealis....	49,7	4,9	19,9	35,0	50,4	5,2	15.28.20,5		B.
	(h) Antares.....	...	...	...	16,3	31,3	46,1	16.20. 1,1		B.
	$\alpha$ Aquilæ..... (blazing)	59,1	12,4	26,1	39,2	53,1	6,7	19.43.20,1		B.
	$\beta$ Aquilæ.....	27,2	41,1	54,5	8,1	21,8	35,0	19.47.48,5		B.
	$\alpha^s$ Capricorni.....	10,0	23,7	37,3	51,2	5,2	19,0	20. 9.32,6		B.
	$\beta$ Aquarii.....	8,7	22,1	36,1	49,2	3,0	16,1	21.23.29,9		B.
	$\alpha$ Aquarii.....	35,0	48,7	2,1	15,3	29,2	42,1	21.57.55,7		B.
	$\alpha$ Andromedæ.....	1,9	17,1	32,4	47,9	3,1	18,1	0. 0.33,2		B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.  
Transit levelled Oct. 25,  $2\frac{1}{4}^h$ ; Oct. 30,  $2\frac{1}{2}^h$ ; and Nov. 6,  $2\frac{1}{2}^h$ .

(a) An unsteady blur.

(b) Cloudy and faint.

(c) Cloudy with much unsteadiness.

(d) Very cloudy and unsteady.

(e) Confused by a star near. The observation is probably 1' in excess.

(f) Too cloudy for more wires.

(g) Hazy and unsteady. (h) Cloudy and very unsteady.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
0.48.3,02 1.21.26,80 1.58.5,16		-0,16	4,31 26,88 5,25	10,79	5,54	0,67	5,59	0.48.9,92 1.21.32,51 1.58.10,90	A.S.C. 91. Juno. $\alpha$ Arietis.
22.56.42,13 23.33.47,56 0.3.52,66			42,25 47,66 52,76	48,17	5,92	0,40	5,54	22.56.48,17 23.33.53,59 0.3.58,70	$\alpha$ Pegasi. $\lambda$ Piscium. $\gamma$ 1 L.
3.37.50,02 3.55.5,69 4.9.20,40 4.26.35,56 4.32.29,53 4.53.22,78		+1,96	50,23 5,90 20,61 35,77 29,74 22,99	45,44	9,67	0,82	9,51	3.37.59,86 3.55.15,54 4.9.30,26 4.26.45,43 4.32.39,40 4.53.32,67	$\eta$ Tauri. A <sup>1</sup> Tauri. $\gamma$ 2 L. Aldebaran. $\tau$ Tauri. $\iota$ Tauri.
12.9.2,57 13.2.22,87	18,50		2,79 21,57	32,24	10,67	0,79	10,34	12.9.13,53 1.2.32,34	Venus 2 L. Polaris SP.
13.59.30,97 14.1.43,60 14.8.9,33 19.42.47,16 19.47.15,44 20.8.58,85 1.2.19,57 1.17.3,87 1.57.59,46	24,03		37,51 9,54 47,37 15,65 59,07 21,17 4,08 59,67	20,55 58,06 26,75 10,06 32,20 10,86	11,01 10,69 11,10 10,99 11,03 11,19			14.0.48,31 14.8.20,34 19.42.58,36 19.47.26,64 20.9.10,07 1.2.32,33 1.17.15,25 1.58.10,86	$\odot$ 's center. Arcturus. $\alpha$ Aquilæ. $\beta$ Aquilæ. $\alpha^2$ Capricorni. Polaris. Juno. $\alpha$ Arietis.
12.9.50,12 13.2.19,34	15,28	+2,26	50,35 18,82	31,97	13,15	0,84	11,77	12.10.2,55 1.2.31,04	Venus 2 L. Polaris SP.
22.57.23,64 23.59.55,55 1.2.17,81 1.15.52,71 1.57.57,90 11.40.39,14	21,95		23,87 55,77 18,65 52,94 58,11 39,36	8,30 31,87	12,53 13,22			22.57.36,44 0.0.8,38 1.2.31,30 1.16.5,59 1.58.10,79 11.40.52,46	Uranus. $\alpha$ Andromedæ. Polaris. Juno. $\alpha$ Arietis. $\beta$ Leonis.
19.42.44,50 19.47.13,11 21.57.20,45 13.2.17,83 14.8.6,46	13,77		44,72 13,33 20,67 17,31 6,68	58,02 26,71 34,12 31,48 20,57	13,30 13,38 13,45 14,17 13,89	0,59	13,45	19.42.58,09 19.47.26,71 21.57.34,12 1.2.31,08 14.8.20,48	$\alpha$ Aquilæ. $\beta$ Aquilæ. $\alpha$ Aquarii. Polaris SP. Arcturus.
14.14.54,46 14.17.7,97 17.27.15,30 19.42.43,84 19.47.12,58			1,45 15,52 44,06 12,80	29,39 58,00 26,69	13,87 13,94 13,89			14.16.15,25 17.27.29,40 19.42.57,99 19.47.26,74	$\odot$ 's center. $\alpha$ Ophiuchi. $\alpha$ Aquilæ. $\beta$ Aquilæ.
14.34.26,65 14.36.41,14 15.21.2,17 15.27.35,09 16.19.16,23 19.42.39,53 19.47.8,03 20.8.51,28 21.22.49,30 21.57.15,44 23.59.47,67			34,14 2,41 35,33 16,49 39,78 8,27 51,52 49,54 15,68 47,92	53,46 34,87 57,93 26,62 9,93 7,95 34,05 8,25	18,13 18,38 18,15 18,35 18,41 18,41 18,37 20,33	0,90 0,92	17,59 20,33	14.35.52,28 15.21.20,57 15.27.53,50 16.19.34,69 19.42.58,11 19.47.26,60 20.9.9,86 21.23.7,93 21.57.34,09 0.0.8,25	$\odot$ 's center. Mercury 1 L. $\alpha$ Coronæ Bor. Antares. $\alpha$ Aquilæ. $\beta$ Aquilæ. $\alpha^2$ Capricorni. $\beta$ Aquarii. $\alpha$ Aquarii. $\alpha$ Andromedæ.

Error of Collimation = +0",88.

Level Error = +0",70. From Oct. 20 = +1",25. From Oct. 27 = +1",09. From Nov. 4 = +1",54.

Meridian Error from Oct. 24 by Polaris SP Oct. 25 and Polaris Oct. 26, allowing +0",36 for loss of clock, and +0",06 for change of  $\bar{R}$ .Meridian Error by Polaris SP Oct. 27 and Polaris Oct. 28, allowing +0",42 for loss of clock, and +0",10 for change of  $\bar{R}$  = +2",37; by Polaris Oct. 28 and Polaris SP Oct. 29, allowing +1",26 for loss of clock, and +0",39 for change of  $\bar{R}$  = +2",16. The mean of these is used from Oct. 27.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Nov. 6	Polaris.....	36.58,8	45.20,8	53.44,6	2. 4,2	10.34,7	.....	1. 27. 6,4	+ 2. 46,64	B.
Nov. 9	(a) ☉ 1 L.....	.....	50,9	5,0	19,0	33,2	46,9	14. 55. 1,2	- 7,05	B.
	☉ 2 L.....	52,2	6,3	20,9	35,0	48,9	2,5	14. 57. 17,0		B.
Nov. 11	☉ 1 L.....	39,0	53,2	7,1	21,4	35,9	49,9	15. 3. 4,0		B.
	☉ 2 L.....	55,4	10,0	24,0	38,0	52,3	6,1	15. 5. 20,1		B.
	(b) ☽ 1 L.....	50,9	6,4	22,0	37,9	53,3	9,0	19. 15. 24,2		B.
	α Aquilæ.....	51,7	5,3	19,1	32,3	46,3	59,8	19. 43. 13,3		B.
	β Aquilæ.....	20,8	34,2	47,9	1,3	15,0	28,2	19. 47. 41,9		B.
	α² Capricorni.....	3,1	17,2	30,7	44,3	58,7	12,2	20. 9. 25,9		B.
	(c) α Ceti.....	50,9	4,5	18,0	31,4	45,1	58,3	2. 54. 11,9		B.
Nov. 12	(d) α Aquarii.....	27,1	40,6	54,0	7,8	21,3	34,4	21. 57. 48,1		B.
	Uranus.....	41,7	55,1	8,9	22,2	36,1	49,3	22. 57. 3,2		B.
	α Andromedæ.....	56,1	11,2	26,4	42,1	57,2	12,2	0. 0. 27,8		B.
	Polaris.....	36.51,2	45.13,7	53.38,6	1.59,3	10.28,5	18.36,6	1. 27. 0,8		B.
Nov. 13	α Aquilæ.....	49,9	3,7	17,1	30,8	44,7	58,1	19. 43. 11,5		B.
	ψ Capricorni.....	25,0	39,7	54,3	9,8	25,1	39,3	20. 36. 54,2		B.
Nov. 16	α Aquilæ.....	47,1	0,5	14,0	27,4	41,2	54,9	19. 43. 8,5		B.
	β Aquilæ.....	15,8	29,1	42,7	56,3	10,1	23,3	19. 47. 37,0		B.
	α² Capricorni.....	58,1	12,1	25,7	39,3	53,8	7,2	20. 9. 21,0		B.
	β Aquarii.....	.....	10,8	24,1	37,6	51,2	4,9	21. 23. ....	- 0,02	B.
	α Aquarii.....	23,2	36,7	50,1	3,8	17,4	30,8	21. 57. 44,0		B.
	Uranus.....	31,6	45,0	59,2	12,5	26,2	39,3	22. 56. 53,1		B.
	φ Aquarii.....	51,8	5,2	18,9	32,2	46,1	59,2	23. 6. 13,1		B.
	κ¹ Piscium.....	33,8	47,2	0,8	14,0	27,7	40,9	23. 18. 54,2		B.
	☽ 1 L.....	3,7	17,3	31,2	45,0	59,1	12,9	23. 37. 26,3		B.
	ω Piscium.....	55,6	9,0	22,5	35,9	50,1	3,2	23. 51. 16,9		B.
	α Andromedæ.....	52,1	7,3	22,4	37,9	53,2	8,1	0. 0. 23,4		B.
	d Piscium.....	11,9	25,3	39,0	52,5	6,1	19,7	0. 12. 33,0		B.
Nov. 18	(e) α Andromedæ.....	50,1	5,2	20,4	35,9	51,2	6,2	0. 0. 21,3		B.
	(e) ε Piscium.....	26,7	40,2	53,9	7,3	21,0	.....	0. 54. ....	+ 13,53	B.
	(e) Polaris.....	36.43,8	45. 5,7	.....	1.53,4	10.17,6	.....	1. ....	+ 8. 20,40	B.
	(e) ☽ 1 L.....	4,0	18,2	32,1	46,3	0,8	15,0	1. 25. 29,0		B.
	(e) β Arietis.....	34,2	48,5	3,0	17,2	31,9	46,1	1. 46. 0,1		B.
	α Arietis.....	54,9	9,2	24,1	38,4	53,1	7,5	1. 58. 22,1		B.
	θ¹ Arietis.....	0,1	14,1	28,3	42,7	57,1	11,1	2. 9. 25,3		B.
	α Ceti.....	44,0	57,2	10,9	24,2	37,9	51,0	2. 54. 4,7		B.
Nov. 19	(f) ☉ 1 L.....	22,4	36,9	51,2	5,4	19,7	.....	15. 35. ....	+ 14,29	B.
	(g) Venus 2 L.....	.....	23,4	36,8	50,6	4,4	17,5	12. 52. 30,9	- 6,77	B.
	Polaris SP.....	.....	45.13,8	.....	1.55,3	10.15,6	18.36,3	13. 26. 58,5	- 6. 42,25	B.
	Arcturus.....	4,0	18,2	32,6	47,0	1,8	15,9	14. 8. 29,9		B.
Nov. 20	☉ 1 L.....	32,0	46,2	0,7	14,9	29,2	43,3	15. 39. 57,9		B.
	☉ 2 L.....	50,3	4,5	18,9	33,3	48,0	2,0	15. 42. 16,3		B.
	α Ophiuchi.....	13,9	28,0	41,6	55,3	9,4	23,0	17. 27. 36,8		B.
	α Aquilæ.....	42,9	56,6	10,3	23,9	37,5	50,9	19. 43. 4,7		B.
	β Aquilæ.....	11,7	25,4	39,1	52,3	6,2	19,3	19. 47. 33,1		B.
	α² Capricorni.....	54,1	8,1	21,7	35,6	49,8	3,4	20. 9. 17,2		B.
	β Aquarii.....	53,1	6,7	20,2	33,8	47,1	0,9	21. 23. 14,1		B.
	α Aquarii..... (blur)	19,3	32,9	46,3	0,1	14,0	26,9	21. 57. 40,2		B.
	Uranus.....	25,2	38,3	51,7	5,2	19,1	32,3	22. 56. 46,1		B.
	(h) * N.P.D. 26°. 22'.....	52.16,2	52.44,7	53.15,3	53.43,8	54.14,8	54.45,6	23. 55. 16,4		B.
	α Andromedæ.....	48,1	3,4	19,2	34,1	49,7	4,3	0. 0. 19,9		B.
	Polaris.....	36.41,8	45. 4,3	53.25,3	1.44,4	10.14,8	18.27,4	1. 26. 50,2		B.
	ε Cassiopeiæ . (very cloudy)	.....	25,1	54,9	24,5	.....	23,4	1. 43. 53,2	- 11,72	B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, *GFEDCBA*.  
Transit levelled Nov. 16, 2½<sup>h</sup> and Nov. 22, 0½<sup>h</sup>.

- (a) Faint from haze and clouds.  
(b) Faint and unsteady.  
(c) Gives a discordant clock error.  
(d) Very foggy and hazy all this evening.

- (e) All these observed through clouds.  
(f) Cloudy, faint, and unsatisfactory.  
(h) A star of the 9<sup>th</sup> or 10<sup>th</sup> magnitude. The intervals are unsatisfactory.  
(g) Cloudy.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
1. 2. 4,89	9,93	+2,26	6,63	29,75	23,12	0,92	20,33	1. 2. 27,00	Polaris.
14. 54. 18,98			} 27,09			0,96	22,16	14. 55. 49,85	☉'s center.
14. 56. 34,69									
15. 2. 21,50			} 30,00				24,08	15. 3. 54,68	☉'s center.
15. 4. 37,99									
19. 14. 37,67			37,93					19. 15. 2,78	☉ 1 L.
19. 42. 32,54			32,79	57,84	25,05			19. 42. 57,66	$\alpha$ Aquilæ.
19. 47. 1,33			1,57	26,53	24,96			19. 47. 26,44	$\beta$ Aquilæ.
20. 8. 44,59			44,83	9,84	25,01			20. 9. 9,71	$\alpha^2$ Capricorni.
2. 53. 31,44			31,68	56,47	24,79		25,04	2. 53. 56,84	$\alpha$ Ceti.
21. 57. 7,62			7,86	33,95	26,09	1,00	25,14	21. 57. 33,91	$\alpha$ Aquarii.
22. 56. 22,35			22,59					22. 56. 48,69	Uranus.
23. 59. 41,85			42,10	8,20	26,10			0. 0. 8,24	$\alpha$ Andromedæ.
1. 1. 58,39	3,43		0,13	28,08	27,95		26,14	1. 2. 26,31	Polaris.
19. 42. 30,82			31,10	57,82	26,72	0,79	26,07	19. 42. 57,82	$\alpha$ Aquilæ.
20. 36. 9,63			9,90					20. 36. 36,65	$\psi$ Capricorni.
19. 42. 27,66		+1,80	27,91	57,78	29,87	1,02	29,03	19. 42. 57,78	$\alpha$ Aquilæ.
19. 46. 56,33			56,59	26,47	29,88			19. 47. 26,46	$\beta$ Aquilæ.
20. 8. 39,60			39,84	9,77	29,93			20. 9. 9,73	$\alpha^2$ Capricorni.
21. 22. 37,70			37,94	7,79	29,85			21. 23. 7,88	$\beta$ Aquarii.
21. 57. 3,71			3,96	33,90	29,94			21. 57. 33,92	$\alpha$ Aquarii.
22. 56. 12,41			12,66					22. 56. 42,66	Uranus.
23. 5. 32,35			32,59					23. 6. 2,60	$\phi$ Aquarii.
23. 18. 14,09			14,34					23. 18. 44,36	$\kappa^1$ Piscium.
23. 36. 45,07			45,32					23. 37. 15,31	☉ 1 L.
23. 50. 36,17			36,43					23. 51. 6,47	$\omega$ Piscium.
23. 59. 37,77			38,06	8,17	30,11			0. 0. 8,11	$\alpha$ Andromedæ.
0. 11. 52,50			52,76				30,05	0. 12. 22,82	$d$ Piscium.
23. 59. 35,76			36,05	8,15	32,10	0,98	32,05	0. 0. 8,10	$\alpha$ Andromedæ.
0. 54. 7,35			7,61					0. 54. 39,70	$\epsilon$ Piscium.
1. 1. 50,52	57,00		54,37	25,50	31,13			1. 2. 26,46	Polaris.
1. 24. 46,49			46,75					1. 25. 18,86	☉ 1 L.
1. 45. 17,29			17,56					1. 45. 49,68	$\beta$ Arietis.
1. 57. 38,47			38,73	10,98	32,25			1. 58. 10,86	$\alpha$ Arietis.
2. 8. 42,67			42,93					2. 9. 15,07	$\theta^1$ Arietis.
2. 53. 24,27			24,52	56,53	32,01			2. 53. 56,69	$\alpha$ Ceti.
15. 35. 5,41			5,64					15. 35. 38,32	☉ 1 L.
12. 51. 50,50		+0,43	50,61			0,95	33,00	12. 52. 24,12	Venus 2 L.
13. 1. 53,65	49,91		50,58	25,02	34,44			1. 2. 24,09	Polaris SP.
14. 7. 47,06			47,20	20,85	33,65			14. 8. 20,76	Arcturus.
15. 39. 14,89			} 24,22					15. 40. 57,84	☉'s center.
15. 41. 33,33									
17. 26. 55,43			55,56	29,28	33,72			17. 27. 29,25	$\alpha$ Ophiuchi.
19. 42. 23,83			23,96	57,74	33,78			19. 42. 57,74	$\alpha$ Aquilæ.
19. 46. 52,44			52,56	26,43	33,87			19. 47. 26,35	$\beta$ Aquilæ.
20. 8. 35,70			35,82	9,73	33,91			20. 9. 9,61	$\alpha^2$ Capricorni.
21. 22. 33,70			33,81	7,75	33,94			21. 23. 7,65	$\beta$ Aquarii.
21. 56. 59,95			0,07	33,85	33,78			21. 57. 33,94	$\alpha$ Aquarii.
22. 56. 5,41			5,53					22. 56. 39,44	Uranus.
23. 53. 45,26			45,52					23. 54. 19,47	* N.P.D. 26°. 22'.
23. 59. 34,10			34,24	8,13	33,89			0. 0. 8,19	$\alpha$ Andromedæ.
1. 1. 46,89	50,69		50,06	24,87	34,81		33,95	1. 2. 24,05	Polaris.
1. 42. 24,50			24,75					1. 42. 58,77	$\epsilon$ Cassiopeiæ.

Error of Collimation = + 0",88.

Level Error = + 1",54. From Nov. 13 = + 2",26. From Venus Nov. 19 = + 0",92.

The observations of Polaris Nov. 6 and Nov. 12 shew that in the interval from Oct. 29 to the latter day, the Meridian Error was nearly constant.

Meridian Error from Nov. 16 by Polaris Nov. 18 and Polaris SP Nov. 19, allowing + 1",17 for loss of clock, and + 0",48 for change of  $\mathcal{R}$ . That from Nov. 19 by Polaris SP Nov. 19 and Polaris Nov. 20, allowing + 0",39 for loss of clock and + 0",15 for change of  $\mathcal{R}$ .



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Nov. 20	$\alpha$ Arietis .....	53,1	7,7	22,1	37,0	52,2	6,1	1.58.20,8		B.
	$\epsilon$ Arietis .....	48,1	2,9	17,2	31,6	46,1	0,2	2.50.14,6		B.
	$\alpha$ Ceti .....	42,1	55,4	9,1	22,3	36,0	49,2	2.54.3,0		B.
	$\delta$ Arietis .....	13,8	28,1	42,1	56,2	11,0	24,8	3.2.39,1		B.
	) 1 L. ....	55,7	11,0	26,1	41,2	56,4	11,4	3.30.27,0		B.
	(a) ) 2 L. ....	29,3	44,9	0,1	15,1	30,6	45,4	3.33.0,7		B.
	A <sup>1</sup> Tauri .....	58,1	12,7	27,1	41,8	56,2	10,8	3.55.25,1		B.
Nov. 21	v <sup>1</sup> Tauri .....	28,1	42,4	57,0	11,7	26,3	40,6	4.16.55,1		B.
	$\alpha$ Arietis .....	52,1	6,5	21,0	35,8	50,6	4,9	1.58.19,3		B.
	$\alpha$ Ceti .....	40,7	54,1	7,8	21,3	34,9	48,1	2.54.1,5		B.
	A <sup>1</sup> Tauri .....	56,7	11,3	25,7	40,4	54,8	9,4	3.55.23,7		B.
	v <sup>1</sup> Tauri .....	26,1	40,8	55,9	9,9	24,6	39,2	4.16.53,7		B.
	(b) Aldebaran .....	28,3	...	56,2	10,1	24,3	37,9	4.26.51,9	- 4,67	B.
	) 2 L. ....	51,4	7,1	23,0	38,6	54,2	10,0	4.42.25,2		B.
Nov. 22	(c) Rigel .....	35,8	...	3,1	16,6	30,4	42,9	5.6.57,2	- 4,54	B.
	$\beta$ Tauri .....	50,6	5,9	21,2	36,2	52,1	6,8	5.16.22,2		B.
	Venus 2 L. ....	53,6	6,9	20,7	34,2	47,9	1,2	12.58.14,7		B.
	Polaris SP. ....	...	45.6,6	...	1.45,3	10.8,6	18.31,8	13.26.51,5	- 6.42,30	B.
	Arcturus .....	1,7	15,7	30,0	44,3	59,0	13,1	14.8.27,2		B.
	$\alpha$ Aquilæ .....	40,1	53,8	7,4	21,0	34,8	48,0	19.43.11,7		B.
	$\beta$ Aquilæ .....	8,8	22,5	35,9	49,5	3,4	16,6	19.47.30,0		B.
Nov. 23	$\alpha^2$ Capricorni .....	51,3	5,1	18,9	32,9	47,0	0,3	20.9.14,1		B.
	Uranus .....	21,6	35,1	48,8	2,2	16,0	29,2	22.50.43,0		B.
	$\alpha$ Andromedæ .....	45,1	0,4	16,0	31,1	46,2	1,9	0.0.16,9		B.
	Polaris .....	36.42,3	45.4,6	53.27,2	1.47,8	...	18.26,2	1. ....	+ 6.42,31	B.
	Aldebaran .....	26,9	41,1	54,7	8,8	23,1	36,9	4.26.50,6		B.
	Rigel .....	34,2	48,1	1,5	15,2	28,9	42,3	5.6.55,7		B.
	$\beta$ Tauri .....	48,9	4,3	19,2	35,0	50,3	5,2	5.16.20,5		B.
	$\iota$ Aurigæ .....	59,2	14,7	30,2	46,1	1,7	17,1	5.28.32,6		B.
	) 2 L. .... (unsteady)	49,9	5,3	21,0	36,9	53,0	8,4	5.53.24,0		B.
	$\kappa$ Aurigæ .....	48,1	3,7	19,0	34,7	50,4	5,7	6.5.21,0		B.
	Venus 2 L. ....	50,2	3,8	17,4	30,8	44,6	58,0	13.1.11,8		B.
	Polaris SP. ....	36.41,3	45.3,3	53.17,4	1.46,6	10.7,2	18.27,8	13.26.51,2		B.
	⊙ 1 L. ....	2,7	17,2	31,3	45,8	0,7	14,8	15.52.29,0		B.
	⊙ 2 L. .... (lazy)	21,8	36,0	50,4	5,0	19,6	33,7	15.54.48,1		B.
Nov. 25	$\alpha$ Ophiuchi .....	9,7	23,2	37,0	50,9	5,0	18,4	17.27.32,1		B.
	$\alpha$ Aquilæ .....	38,5	52,0	5,8	19,2	33,1	46,2	19.42.59,9		B.
	$\beta$ Aquilæ .....	7,3	20,9	34,4	48,1	2,0	14,9	19.47.28,3		B.
	$\alpha^2$ Capricorni .....	49,4	3,3	17,1	31,0	45,2	58,7	20.9.12,5		B.
	Uranus .....	20,0	33,3	46,8	0,4	14,2	27,3	22.56.41,0		B.
	(d) * N.P.D. 26°. 22' .....	8,8	40,4	10,3	...	12,4	40,7	23.55.10,8	- 0,02	B.
	Polaris .....	36.36,4	44.58,4	53.18,7	1.41,2	10.13,6	18.25,2	1.26.46,8		B.
	⊙ 1 L. ....	26,8	41,1	55,5	10,0	24,4	38,9	16.0.53,2		B.
	⊙ 2 L. ....	46,0	0,8	15,1	29,3	44,0	58,3	16.3.13,0		B.
	$\beta$ Aquarii .....	45,0	58,7	12,2	25,5	39,3	52,4	21.23.6,1		B.
Nov. 26	(e) $\alpha$ Andromedæ. (Temp. 51°)	40,0	55,2	10,7	26,0	41,1	56,2	0.0.11,8		B.
	⊙ 1 L. ....	40,7	55,1	9,4	23,8	38,3	52,5	16.5.7,3		B.
	⊙ 2 L. .... (haze)	0,5	14,9	29,3	43,6	58,2	12,5	16.7.27,0		B.
	(f) $\alpha$ Herculis .....	55,1	9,0	23,0	...	51,1	4,7	17.7.18,7	- 0,01	B.
	(f) $\alpha$ Ophiuchi .....	5,0	18,7	32,3	46,3	0,2	...	17.27. ....	+ 13,77	B.
	(f) $\alpha$ Aquilæ .....	...	...	...	14,8	28,3	42,0	19.42. ....	- 13,64	B.
	(f) $\beta$ Aquilæ .....	2,8	16,2	29,9	43,4	...	...	19.46. ....	+ 20,31	B.
	$\alpha^2$ Capricorni .....	45,3	59,1	12,9	26,8	41,0	54,1	20.9.8,1		B.
	$\beta$ Aquarii .....	44,1	57,4	10,9	24,8	38,3	51,7	21.23.5,5		B.
	(f) Uranus .....	16,9	30,4	44,0	57,6	11,3	...	22.56. ....	+ 13,55	B.
	$\alpha$ Ceti .....	33,0	46,3	0,0	13,2	27,0	40,3	2.53.53,8		B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.  
Transit levelled Nov. 30. 22<sup>h</sup>.

- (a) This limb very ragged. Correction applied to its apparent  $\mathcal{R}$ . for defect of illumination = + 0<sup>s</sup>.09.  
(b) Cloudy. Extraordinary change of clock error, apparently not due to error of observation.  
(c) Flaring dreadfully. Wires V and VI appear to be bad.

- (d) The star observed Nov. 20. So very faint as to be mere conjecture.  
(e) Considerable change of Temperature since the 23rd.  
(f) All these very cloudy.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>''</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
1. 57. 37,00 2. 49. 31,53 2. 53. 22,44 3. 1. 56,44 3. 29. 41,25 3. 32. 15,16 3. 54. 41,68 4. 16. 11,60		+ 0,43	37,14 31,67 22,56 56,57 41,39 15,30 41,82 11,74	10,98  56,54	33,84  33,98	0,95	33,95	1. 58. 11,17 2. 50. 5,73 2. 53. 56,62 3. 2. 30,64 3. 30. 15,48 3. 32. 49,48 3. 55. 15,92 4. 16. 45,86	$\alpha$ Arietis. $\epsilon$ Arietis. $\alpha$ Ceti. $\delta$ Arietis. $\gamma$ 1 L. $\gamma$ 2 L. $A^1$ Tauri. $\nu$ Tauri.
1. 57. 35,74 2. 53. 21,20 3. 54. 40,28 4. 16. 10,03 4. 26. 10,11 4. 41. 38,50 5. 6. 16,46 5. 15. 36,43 12. 57. 34,17 13. 1. 46,46 14. 7. 44,43	42,72	+ 2,93	35,97 21,45 40,51 10,26 10,34 38,72 16,72 36,65 34,43 47,31 44,66	10,98 56,54  46,00  52,35 12,18  24,37 20,89	35,01 35,09  35,66  35,63 35,53  37,06 36,23	1,45       1,73	35,14       35,08	1. 58. 11,23 2. 53. 56,76 3. 55. 15,89 4. 16. 45,66 4. 26. 45,75 4. 42. 14,14 5. 6. 52,17 5. 16. 12,11 12. 58. 10,44 1. 2. 23,33 14. 8. 20,75	$\alpha$ Arietis. $\alpha$ Ceti. $A^1$ Tauri. $\nu$ Tauri. Aldebaran. $\gamma$ 2 L. Rigel. $\beta$ Tauri. Venus 2 L. Polaris SP. Arcturus.
19. 42. 20,97 19. 46. 49,53 20. 8. 32,80 22. 56. 2,27 23. 59. 31,08 1. 1. 47,93 4. 26. 8,88 5. 6. 15,13 5. 15. 34,77 5. 27. 45,94 5. 52. 36,93 6. 4. 34,66 13. 0. 30,94 13. 1. 44,97	51,73		21,22 49,77 33,07 2,53 31,30 47,45 9,11 15,39 34,99 46,16 37,15 34,88 31,20 45,82	57,72 26,41 9,71  8,11 24,17 46,02 52,37 12,21     23,96	36,50 36,64 36,64  36,81 36,72 36,91 36,98 37,22     38,14			19. 42. 57,72 19. 47. 26,28 20. 9. 9,60 22. 56. 39,26 0. 0. 8,11 1. 2. 24,33 4. 26. 46,24 5. 6. 52,57 5. 16. 12,18 5. 28. 23,37 5. 53. 14,38 6. 5. 12,13 1. 1. 8,98 1. 2. 23,60	$\alpha$ Aquilæ. $\beta$ Aquilæ. $\alpha^s$ Capricorni. Uranus. $\alpha$ Andromedæ. Polaris. Aldebaran. Rigel. $\beta$ Tauri. $\iota$ Aurigæ. $\gamma$ 2 L. $\kappa$ Aurigæ. Venus 2 L. Polaris SP.
15. 51. 45,93 15. 54. 4,94 17. 26. 50,90 19. 42. 19,25 19. 46. 47,99 20. 8. 31,02 22. 56. 0,43 23. 53. 40,55 1. 1. 42,90	46,70		55,72 51,14 19,50 48,23 31,29 0,69 40,73 42,42	 29,28 57,72 26,40 9,71   23,73	 38,14 38,22 38,17 38,42   41,31			15. 53. 33,71 17. 27. 29,25 19. 42. 57,77 19. 47. 26,51 20. 9. 9,59 22. 56. 39,20 23. 54. 19,31 1. 2. 21,08	$\odot$ 's center. $\alpha$ Ophiuchi. $\alpha$ Aquilæ. $\beta$ Aquilæ. $\alpha^s$ Capricorni. Uranus. * N.P.D. 26°. 22'. Polaris.
16. 0. 9,98 16. 2. 29,50 21. 22. 25,60 23. 59. 25,86		+ 2,92	20,03 25,89 26,13	 7,69 8,08	 41,80 41,95	1,70	40,27	16. 2. 1,43 21. 23. 7,77 0. 0. 8,10	$\odot$ 's center. $\beta$ Aquarii. $\alpha$ Andromedæ.
16. 4. 23,87 16. 6. 43,68 17. 6. 36,92 17. 26. 46,27 19. 42. 14,73 19. 46. 43,38 20. 8. 26,76 21. 22. 24,67 22. 55. 57,59 2. 53. 13,37			34,07 37,19 46,54 15,01 43,66 27,05 24,96 57,87 13,65	 19,96 29,28 57,69 26,37 9,68 7,68 56,57	42,77 42,74 42,68 42,71 42,63 42,72 42,92	0,95	41,93       42,88	16. 6. 16,64 17. 7. 19,80 17. 27. 29,16 19. 42. 57,72 19. 47. 26,37 20. 9. 9,78 21. 23. 7,73 22. 56. 40,71 2. 53. 56,64	$\odot$ 's center. $\alpha$ Herculis. $\alpha$ Ophiuchi. $\alpha$ Aquilæ. $\beta$ Aquilæ. $\alpha^s$ Capricorni. $\beta$ Aquarii. Uranus. $\alpha$ Ceti.

Error of Collimation = +0'',88.

Level Error = +0'',92. From Nov. 25 = +1'',60.

The two sets of three consecutive transits of Polaris Nov. 21, 22, and 23, give for Meridian Error +3'',22 and +2'',64, the mean of which is used from Nov. 21.

Meridian Error from Nov. 25, by the three transits of Polaris alternately above and below the Pole on Nov. 26, 28, and 29, allowing nothing for clock rate and change of  $\mathcal{R}$ .



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Nov. 26	(a) Polaris SP.....	...	...	53. 9,3	1.40,6	10. 1,2	18.23,7	13. 26. 48,4	- 8. 20,81	B.
	Venus 2 L.....	10,7	24,4	37,9	51,5	5,4	18,6	13. 13. 32,4		B.
	Arcturus..... (blazing)	53,9	8,1	22,3	36,7	51,2	5,1	14. 8. 19,6		B.
Nov. 27	(b) ☉ 1 L.....	54,7	9,2	23,6	38,2	53,0	7,1	16. 9. 21,5		B.
	☉ 2 L.....	15,0	29,3	43,7	58,1	13,0	26,9	16. 11. 41,4		B.
Nov. 28	Polaris.....	...	...	53.14,2	1.33,8	10. 5,0	18.15,4	1. 26. 39,6	- 8. 22,03	B.
	α Arietis.....	40,9	55,4	10,0	24,5	39,3	53,5	1. 58. 8,2		B.
	α Ceti... (cloudy)	29,8	43,0	56,5	10,0	23,6	36,9	2. 53. 50,4		B.
Nov. 29	☾ 2 L.....	23,0	36,9	50,7	4,5	18,3	31,9	12. 13. 45,6		B.
	γ <sup>1</sup> Virginis.....	3,9	17,1	30,4	43,9	57,2	10,9	12. 33. 24,2		B.
	Polaris SP.....	36.29,6	...	53. 3,8	1.35,4	9.57,3	18.18,7	13. 26. 40,5	- 2. 46,86	B.
	(c) Venus 2 L.....	57,7	11,6	24,9	38,4	52,3	5,5	13. 23. 19,1		B.
	Arcturus.....	48,8	3,1	17,4	31,8	46,1	0,4	14. 8. 14,8		B.
	ε Bootis.....	24,0	39,1	54,2	9,5	25,0	40,0	14. 37. 55,1		B.
Nov. 30	Polaris.....	36.21,5	44.41,8	53. 5,7	1.26,4	9.54,2	18. 5,7	1. 26. 32,6		B.
	α Arietis.....	37,2	51,7	6,3	20,9	35,8	50,1	1. 58. 4,8		B.
	☾ 2 L.....	15,4	29,2	43,1	57,2	11,3	25,0	12. 57. 39,0		B.
	Polaris SP.....	36.27,6	44.47,8	53. 2,5	1.32,6	9.56,2	18.17,2	13. 26. 39,7		B.
	Spica.....	13,7	27,0	40,8	54,4	8,4	22,0	13. 16. 35,7		B.
	Arcturus.....	47,0	1,6	16,0	30,1	44,9	58,9	14. 8. 13,0		B.
	ε Bootis.....	22,3	37,7	52,9	8,0	23,0	38,3	14. 37. 53,4		B.
Dec. 3	(c) Venus 2 L.....	37,5	51,4	4,7	18,4	32,6	45,9	13. 36. 59,5		B.
	Arcturus.....	42,0	56,7	11,0	25,2	39,8	53,9	14. 8. 8,0		B.
	ε Bootis.....	17,3	32,4	47,8	3,0	18,2	33,1	14. 37. 48,2		B.
Dec. 5	(d) α Ophiuchi.....	...	...	18,0	31,4	45,2	59,0	17. 27. 12,8	- 13,80	B.
	α Aquilæ.....	18,8	32,0	45,9	59,4	13,2	26,9	19. 42. 40,2		B.
	β Aquilæ.....	47,5	1,1	14,7	28,1	41,8	55,0	19. 47. 8,7		B.
	β Aquarii.....	29,0	42,1	55,7	9,2	23,1	36,2	21. 22. 50,0		B.
	α Aquarii.....	55,1	8,5	22,1	35,2	49,1	1,9	21. 57. 15,8		B.
Dec. 7	β Aquarii.....	25,3	38,8	52,3	5,9	19,8	33,0	21. 22. 46,6		B.
	(d) Uranus.....	18,0	31,8	45,3	58,8	12,8	...	22. 56. ....	+ 13,55	B.
	α Andromedæ.....	20,7	35,9	51,0	6,2	21,9	36,9	23. 59. 52,1		B.
Dec. 12	(d) θ Aquarii.....	...	...	...	12,0	26,3	39,4	22. 7. 53,2	- 20,42	B.
	(d) ☾ 1 L.....	17,0	31,0	44,6	59,0	13,3	27,0	22. 27. 41,0		B.
	(d) λ Aquarii.....	24,1	37,9	51,3	4,9	18,9	32,2	22. 43. 46,1		B.
	(d) Uranus.....	...	...	53,0	6,2	20,1	33,8	22. 56. 47,3	- 13,58	B.
	(e) φ Aquarii.....	10,8	24,1	37,8	51,1	5,0	18,3	23. 5. 32,0		B.
	Arcturus.....	26,8	40,9	55,0	9,7	24,2	38,1	14. 7. 52,3		B.
	(f) Jupiter 1 L.....	3,0	...	30,4	...	58,2	...	14. 30. 26,0	- 0,03	B.
	Jupiter 2 L.....	...	18,8	...	46,6	...	14,3	14. 30. ....	+ 0,04	B.
	ε Bootis.....	1,7	17,0	32,1	47,2	2,8	17,7	14. 37. 32,8		B.
	α Coronæ Borealis....	56,6	11,8	27,0	42,1	57,2	12,1	15. 27. 27,3		B.
Dec. 13	(g) ☾ 1 L.....	31,1	45,2	59,1	13,0	26,7	40,4	23. 17. 54,2		B.
	(g) α Andromedæ.....	9,4	24,9	40,1	55,2	10,8	25,8	0. 0. 41,1		B.
	(g) α Arietis.....	14,7	29,1	43,7	58,4	13,1	27,1	1. 58. 42,0		B.
	(h) Aldebaran.....	...	...	19,8	33,8	47,7	1,4	4. 27. 15,3	- 14,01	B.
Dec. 14	(i) ☉ 1 L.....	29,0	43,3	58,0	13,0	28,0	42,4	17. 23. 57,0		B.
	☉ 2 L.....	51,1	6,0	20,9	35,3	50,2	5,0	17. 26. 19,3		B.
	(k) α Aquilæ.....	3,0	16,6	30,0	43,7	57,5	11,0	19. 43. 24,4		B.
	(g) α Andromedæ.....	8,0	23,1	38,1	53,9	9,3	23,9	0. 0. 39,2		B.
	(k) ☾ 1 L.....	23,8	37,3	51,1	5,0	19,0	32,4	0. 7. 46,3		B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.

Transit levelled Dec. 5, 2 $\frac{1}{2}$ <sup>h</sup>, and Dec. 14, 2 $\frac{1}{2}$ <sup>h</sup>.Before the observation of the Moon Dec. 13 the clock was put forward 1<sup>m</sup>.

(a) Wire II was written down 44.47,7 and appearing to be 10<sup>s</sup> in defect, was rejected. (b) Hazy and very faint. (c) Great motion. (d) Cloudy. (e) Very cloudy. Note by the observer, '1<sup>s</sup> too much.' The observation has been diminished 1<sup>s</sup>. (f) Very faint. (g) Hazy and faint. (h) Cloudy, then blazing. (i) Pretty good. (k) Satisfactory observations.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.	
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>		
13. 1. 39,83 13. 12. 51,55 14. 7. 36,70	34,79	+ 2,92	39,36 51,84 36,97	21,78  20,98	42,42  44,01	1,59	43,07	1. 2. 23,29 13. 13. 35,78 14. 8. 20,97	Polaris SP. Venus 2 L. Arcturus.	
16. 8. 38,19 16. 10. 58,20		}	43,49					16. 10. 32,63	☉'s center.	
1. 1. 35,57 1. 57. 24,54 2. 53. 10,02	40,73			36,46 24,81 10,30	20,90 10,98 56,58	44,44 46,17 46,28	1,67	46,06	1. 2. 22,59 1. 58. 11,01 2. 53. 56,56	Polaris. α Arietis. α Ceti.
12. 13. 4,41 12. 32. 43,94 13. 1. 34,02 13. 22. 38,50 14. 7. 31,77 14. 37. 9,56	28,98		+ 1,34	4,61 44,13 31,08 38,69 31,98 9,78	20,04  48,96 21,05 58,90	48,96  49,07 49,12	1,76	47,99	12. 13. 53,49 12. 33. 33,04 1. 2. 20,02 13. 23. 27,66 14. 8. 21,00 14. 37. 58,84	δ 2 L. γ <sup>1</sup> Virginis. Polaris SP. Venus 2 L. Arcturus. ε Bootis.
1. 1. 26,84 1. 57. 20,97 12. 56. 57,17 13. 1. 31,94 13. 15. 54,57 14. 7. 30,21 14. 37. 7,95	32,00  26,90		30,04 21,18 57,36 29,00 54,76 30,42 8,17	19,76 10,97 19,49 45,46 21,07 58,92	49,72 49,79 50,49 50,70 50,65 50,75	49,75 1,66 49,73	1. 2. 19,86 1. 58. 11,07 12. 57. 47,98 1. 2. 19,63 13. 16. 45,41 14. 8. 21,12 14. 37. 58,91	Polaris. α Arietis. δ 2 L. Polaris SP. Spica. Arcturus. ε Bootis.		
13. 36. 18,57 14. 7. 25,23 14. 37. 2,85			18,76 25,42 3,05	21,14 55,72 55,94	55,72 55,94	1,70	54,81	13. 37. 14,53 14. 8. 21,23 14. 37. 58,89	Venus 2 L. Arcturus. ε Bootis.	
17. 26. 31,48 19. 41. 59,49 19. 46. 28,13 21. 22. 9,33 21. 56. 35,39			31,67 59,68 28,31 9,52 35,57	29,31 57,63 26,31 7,59 33,68	57,64 57,95 58,00 58,07 58,11	1,69	56,54	17. 27. 29,44 19. 42. 57,61 19. 47. 26,24 21. 23. 7,56 21. 57. 33,65	α Ophiuchi. α Aquilæ. β Aquilæ. β Aquarii. α Aquarii.	
21. 22. 5,96 22. 55. 58,89 23. 59. 6,39			6,15 59,08 6,59	7,57 7,94	61,42 61,35	1,63	59,85	21. 23. 7,45 22. 57. 0,49 0. 0. 8,07	β Aquarii. Uranus. α Andromedæ.	
22. 7. 12,30 22. 26. 58,99 22. 43. 5,06 22. 56. 6,50 23. 4. 51,30 14. 7. 9,58 14. 29. 44,37 14. 29. 46,61 14. 36. 47,33 15. 26. 42,01		+ 2,15	12,54 59,22 5,30 6,74 51,53 9,80 45,73 47,57 42,25	21,38 59,21 53,90	71,58 71,64 71,65	1,70	68,85	22. 8. 22,96 22. 28. 9,65 22. 44. 15,76 22. 57. 17,21 23. 6. 2,02 14. 8. 21,35 14. 30. 57,31 14. 37. 59,15 15. 27. 53,89	θ Aquarii. δ 1 L. λ Aquarii. Uranus. φ Aquarii. Arcturus. Jupiter's center. ε Bootis. α Coronæ Bor.	
23. 17. 12,81 23. 59. 55,33 1. 57. 58,30 4. 26. 33,59			13,04 55,57 58,53 33,82	7,86 10,93 46,26	12,29 12,40 12,44	10,55 12,25	23. 17. 25,24 0. 0. 7,82 1. 58. 10,92 4. 26. 46,38	δ 1 L. α Andromedæ. α Arietis. Aldebaran.		
17. 23. 12,95 17. 25. 35,40 19. 42. 43,74 23. 59. 53,64 0. 7. 4,99	53,81	}	24,42 43,97 53,88 5,22	57,61 7,85	13,64 13,97	1,66	12,23	17. 24. 37,85 19. 42. 57,56 0. 0. 7,77 0. 7. 19,12	☉'s center. α Aquilæ. α Andromedæ. δ 1 L.	

Error of Collimation = + 0'',88.

Level Error = + 1'',60. From Dec. 3 = + 1'',35. From Dec. 12 = + 1'',40.

Meridian Error from Nov. 29 by Polaris SP, Polaris, and Polaris SP Nov. 29 and 30.

..... from Dec. 12 by Polaris with α Andromedæ and α Arietis Dec. 14, allowing nothing for clock rate.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	1.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Dec. 14	$\delta$ Piscium.....	28,8	42,3	56,0	9,5	23,2	36,4	0.40.50,1		B. B. B. B. B. B. B.
	(a) Polaris.....	36.48,3	....	53.34,7	1.53,8	10.24,2	....	1. ....	+ 6.15,38	
	$\alpha$ Arietis.....	13,1	27,4	42,0	56,4	11,4	25,9	1.58.40,2		
	A.S.C. 268.....	25,0	38,5	52,0	5,9	19,3	32,9	2.27.46,2		
	A.S.C. 279.....	56,0	9,8	23,1	36,9	50,9	4,1	2.32.17,3		
	$\alpha$ Ceti.....	2,0	15,2	29,0	42,4	55,9	9,1	2.54.22,7		
	14 Eridani.....	....	10,4	24,1	37,8	51,3	5,1	3.9.18,8	- 6,83	
	Aldebaran.....	49,9	4,1	18,0	31,8	45,9	59,7	4.27.14,2		
Dec. 15	(b) Venus 2 L.....	....	....	....	56,7	10,6	24,1	14.22.37,8	- 20,64	B. B.
	$\alpha$ Ophiuchi.....	31,1	44,9	58,7	12,4	26,3	39,9	17.27.53,7		
Dec. 16	(c) $\odot$ 1 L.....	16,4	31,0	46,0	0,5	15,4	30,0	17.32.44,9		B. B. B. B. B. B. B. B. B. B.
	$\odot$ 2 L.....	39,0	53,7	8,3	23,1	38,0	52,4	17.35.7,3		
	$\alpha$ Aquarii.....	35,8	49,3	2,8	16,2	29,8	43,1	21.57.56,3		
	(d) Polaris.....	36.46,7	....	53.32,5	1.50,3	10.21,7	18.36,2	1.27.1,4	- 2.47,42	
	$\eta$ Piscium.....	57,1	11,1	24,8	39,1	53,1	6,7	1.23.20,8		
	(d) $\circ$ Piscium.....	....	13,1	26,9	40,3	54,1	7,3	1.37.21,1	- 6,80	
	(d) $\circ$ 1 L.....	0,8	15,0	29,4	43,9	58,3	12,4	1.55.27,0		
	(d) $\nu$ Arietis.....	44,5	58,9	14,0	28,0	42,4	56,8	2.30.11,2		
	$\odot$ 1 L. {	41,0	55,8	10,3	24,9	39,9	54,3	17.37.8,9		
	$\odot$ 2 L. { (hazy)	3,1	17,9	32,4	47,2	2,4	16,8	17.39.31,4		
Dec. 17	$\alpha$ Aquilæ.....	57,8	11,1	24,9	38,5	52,0	5,8	19.43.19,2		B. B. B. B. B. B. B. B. B. B.
	$\alpha$ Aquarii.....	34,0	47,3	0,8	14,2	28,0	41,2	21.57.54,8		
	(d) Uranus.....	38,1	51,6	5,8	19,1	33,0	46,1	22.57.59,8		
	(e) Uranus.....	48,1	1,4	15,1	28,8	42,2	55,7	22.58.9,6		
	Polaris.....	36.34,2	44.56,3	53.20,6	....	10.12,4	18.25,8	1.26.49,4	- 0,27	
	$\alpha$ Arietis.....	2,8	17,1	31,8	46,4	1,1	15,1	1.58.30,2		
	$\alpha$ Ceti.....	51,2	4,9	18,1	31,9	46,0	58,8	2.54.12,2		
	Aldebaran.....	39,3	53,8	7,9	21,4	36,2	49,4	4.27.4,1		
	Rigel.....	....	1,1	14,2	28,0	41,7	54,9	5.7.9,2	- 6,80	
	$\beta$ Tauri.....	2,0	17,1	32,0	47,8	3,3	18,0	5.16.33,5		
Dec. 20	C Tauri.....	7,9	22,9	38,0	53,1	8,7	23,2	5.43.38,8		B. B. B. B. B. B. B. B. B. B. B. B. B. B. B. B.
	$\alpha$ Orionis.....	26,8	40,3	54,0	7,7	21,1	34,6	5.46.48,1		
	$\kappa$ Aurigæ.....	1,7	17,1	32,2	47,9	3,9	19,0	6.5.34,0		
	(f) $\circ$ 2 L.....	7,4	23,0	38,9	54,7	10,5	25,9	6.25.41,5		
	$\tau$ Geminorum.....	47,0	2,7	18,0	33,9	49,7	5,0	7.1.20,7		
	$\delta$ Geminorum.....	26,9	41,2	56,1	10,5	25,2	39,2	7.10.54,0		
	(g) Castor.....	12,1	28,0	44,1	59,9	16,2	31,7	7.24.47,6		
	(g) Procyon.....	51,4	5,1	18,5	32,1	46,0	59,1	7.31.12,5		
	(g) Pollux.....	21,8	37,1	52,4	8,0	23,3	38,2	7.35.53,7		
	(h) Jupiter 1 L.....	36,1	....	3,9	....	....	....	14.36.59,7	+ 4,66	
	Jupiter 2 L.....	....	52,4	....	20,3	34,9	48,2	14.36. ....	- 3,50	
	Venus 2 L.....	16,2	29,8	43,4	57,6	11,7	25,3	14.42.39,1		
	$\alpha$ Coronæ Borealis.....	43,0	58,0	13,4	28,5	43,9	58,7	15.28.13,9		
	$\alpha$ Herculis.....	13,0	26,7	40,8	54,7	8,8	22,4	17.7.36,4		
	$\alpha$ Ophiuchi.....	22,6	36,0	50,1	4,0	17,8	31,4	17.27.45,1		
	$\odot$ 1 L.....	18,9	34,0	48,8	3,7	18,3	32,7	17.54.47,3		
	$\odot$ 2 L.....	41,9	56,4	11,2	26,0	40,9	55,3	17.57.10,0		
Dec. 21	(i) $\delta$ Ursæ Minoris.....	11.45,4	15.30,8	19.17,3	23.4,4	26.54,2	30.35,6	18.34.22,4		B. B. B. B.
	$\alpha$ Aquilæ.....	51,0	....	....	31,8	....	59,1	19.43.12,9	- 6,76	
Dec. 22	(d) Jupiter 1 L.....	57,0	....	24,9	....	53,0	....	14.38.20,1	- 0,03	B. B. B. B. B.
	Jupiter 2 L.....	....	13,6	....	41,2	....	9,3	14.38. ....	+ 0,04	
	$\alpha^s$ Libræ.....	51,1	5,2	19,0	33,1	47,0	1,1	14.42.15,1		
	(d) Venus 2 L.....	29,9	43,7	57,6	11,4	25,5	39,3	14.50.53,2		
	$\alpha$ Coronæ Borealis.....	40,3	55,3	10,9	25,7	41,1	55,9	15.28.11,0		

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.  
Transit levelled Dec. 18, 2 $\frac{1}{2}$ h, and Dec. 24, 2 $\frac{1}{2}$ h.

- (a) Cloudy. Wire VII was written down 26.51,4, and being discordant with the rest is rejected.  
(b) Cloudy and unsteady.  
(c) Satisfactory.  
(d) Cloudy.

- (e) All the observations to midnight taken through clouds.  
(f) Good.  
(h) Confused and very faint.  
(i) Very steady.  
(g) Blazing.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
0.40. 9,48 1. 1. 55,63 1. 57. 56,63 2. 27. 5,69 2. 31. 36,87 2. 53. 42,33 3. 8. 37,75 4. 26. 31,94	60,39 56,78	+ 2,15	9,71 57,24 56,86 5,92 37,10 42,56 37,98 32,17	11,26 10,92	14,02 14,06	1,66	13,89	0.40. 23,65 1. 2. 11,20 1. 58. 10,88 2. 27. 19,98 2. 31. 51,16 2. 53. 56,65 3. 8. 52,09 4. 26. 46,37	δ Piscium. Polaris. α Arietis. A.S.C. 268. A.S.C. 279. α Ceti. 14 Eridani. Aldebaran.
14. 21. 56,66 17. 27. 12,43			56,88 12,64	29,41	16,77	1,80	15,49	14. 22. 13,45 17. 27. 29,44	Venus 2 L. α Ophiuchi.
17. 32. 0,60 17. 34. 23,11 21. 57. 16,19 1. 1. 54,05 1. 22. 38,96 1. 36. 40,33 1. 54. 43,83 2. 29. 27,97	58,19		12,09 16,41 55,04 39,17 40,54 44,04 28,18	33,58 9,98	17,17 14,94		17,29	17. 33. 28,89 21. 57. 33,54 1. 2. 12,41 1. 22. 56,57 1. 36. 57,95 1. 55. 1,47 2. 29. 45,66	☉'s center. α Aquarii. Polaris. η Piscium. ο Piscium. J 1 L. α Arietis.
17. 36. 25,01 17. 38. 47,32 19. 42. 38,47 21. 57. 14,33 22. 57. 19,07			36,40 38,68 14,55 19,29	57,60 33,57	18,92 19,02	1,87	17,35	17. 37. 55,12 19. 42. 57,56 21. 57. 33,61 22. 57. 38,43	☉'s center. α Aquilæ. α Aquarii. Uranus.
22. 57. 28,70 1. 1. 42,85 1. 57. 46,36 2. 53. 31,87 4. 26. 21,72 5. 6. 28,05 5. 15. 47,67 5. 42. 53,23 5. 46. 7,52 6. 4. 47,97 6. 24. 54,56 7. 0. 33,86 7. 10. 10,44 7. 23. 59,95 7. 30. 32,10 7. 35. 7,79 14. 36. 17,89 14. 36. 20,45 14. 41. 57,59 15. 27. 28,49 17. 6. 54,69 17. 27. 3,86	46,99 46,49	+ 2,47	28,94 43,38 46,58 32,10 21,94 28,30 47,90 53,46 7,75 48,19 54,78 34,08 10,66 0,17 32,33 8,01 19,42 57,83 28,71 54,91 4,09	7,58 10,89 56,58 46,31 52,71 12,68 32,33 24,80 56,89 32,78	24,20 24,31 24,48 24,37 24,41 24,78 24,58	1,66	22,51 24,17	22. 57. 53,03 1. 2. 7,62 1. 58. 10,88 2. 53. 56,47 4. 26. 46,42 5. 6. 52,82 5. 16. 12,44 5. 43. 18,02 5. 46. 32,31 6. 5. 12,78 6. 25. 19,39 7. 0. 58,73 7. 10. 35,33 7. 24. 24,85 7. 30. 57,02 7. 35. 32,70	Uranus. Polaris. α Arietis. α Ceti. Aldebaran. Rigel. β Tauri. C Tauri. α Orionis. κ Aurigæ. J 2 L. τ Geminorum. δ Geminorum. Castor. Procyon. Pollux.
14. 36. 17,89 14. 36. 20,45 14. 41. 57,59 15. 27. 28,49 17. 6. 54,69 17. 27. 3,86			19,42 57,83 28,71 54,91 4,09	54,09 20,21 29,48	25,38 25,30 25,39	1,65	24,18	14. 36. 44,60 14. 42. 23,02 15. 27. 53,95 17. 7. 20,16 17. 27. 29,47	Jupiter's center. Venus 2 L. α Coronæ Bor. α Herculis. α Ophiuchi.
17. 54. 3,38 17. 56. 25,96 18. 23. 4,30 19. 42. 31,94			14,92 4,65 32,17	30,41 57,60	25,76 25,43			17. 55. 40,33 18. 23. 30,09 19. 42. 57,70	☉'s center. δ Ursæ Minoris. α Aquilæ.
14. 37. 38,72 14. 37. 41,41 14. 41. 33,08 14. 50. 11,51 15. 27. 25,75			40,35 33,55 11,78 26,04	1,65 54,14	28,30 28,10	1,32	27,37	14. 38. 8,52 14. 42. 1,53 14. 50. 39,97 15. 27. 54,26	Jupiter's center. α <sup>2</sup> Libræ. Venus 2 L. α Coronæ Bor.

Error of Collimation = + 0'',88.

Level Error = + 1'',40. From Dec. 15 = + 1'',09. From Dec. 22 = + 2'',00.

Meridian Error from Dec. 20 by Polaris and α Arietis Dec. 20, allowing + 0'',11 for clock rate. The observation of Polaris Dec. 16 shews that on that day no considerable change of Meridian Error had taken place.



Month and Day.	NAME OF STAR or PLANET, and Circumstances of Observation.	I.	II.	III.	IV.	V.	VI.	VII. Wire.	Correction to Mean of Wires Observed.	Observer.
		m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	h. m. s.	m. s.	
Dec. 24	(a) ☉ 1 L.....	34,9	49,3	4,1	19,0	34,1	48,3	18. 8. 3,1		B.
	(a) α Aquilæ.....	46,6	0,3	14,0	27,8	41,4	54,8	19. 43. 8,4		B.
	(b) Uranus.....	5,2	18,6	31,7	45,3	58,9	12,4	22. 58. 26,2		B.
	α Andromedæ.....	52,1	7,2	22,2	37,4	53,1	8,0	0. 0. 23,2		B.
	(c) α Arietis.....	56,8	11,4	26,1	40,7	55,4	9,9	1. 58. 24,2		B.
	Aldebaran..... (cloudy)	34,1	48,0	2,1	....	....	44,2	4. 26. 58,0	+ 2,84	B.
	(d) Rigel.....	42,0	55,2	8,9	22,2	36,1	49,3	5. 7. 3,1		B.
	(d) β Tauri.....	56,2	11,7	27,0	42,1	57,5	13,0	5. 16. 28,2		B.
	(e) Procyon.....	46,2	59,7	13,3	26,6	40,5	53,7	7. 31. 7,2		C.
	(e) Pollux.....	16,8	32,0	47,4	2,6	18,2	33,1	7. 35. 48,5		C.
	(f) Arcturus..... (Temp. 40°)	8,1	22,6	36,8	51,0	5,7	19,5	14. 8. 34,0		C.
Dec. 25	(g) Venus 2 L..... (Temp. 40°)	4,6	18,6	32,3	46,3	0,7	14,2	15. 3. 28,3		B.
Dec. 27	☉ 1 L.....	49,9	4,7	19,3	33,9	48,8	3,3	18. 21. 17,9		B.
	☉ 2 L.....	12,7	27,0	41,9	56,4	11,4	26,0	18. 23. 40,9		B.
	δ Ursæ Minoris.....	11.38,5	....	....	....	....	30.27,2	18. 34. 14,5	- 2. 30,04	B.
	α Ceti.....	41,3	54,9	8,4	21,9	35,5	48,8	2. 54. 2,4		B.
	Aldebaran.....	29,5	43,4	57,3	11,8	26,1	39,4	4. 26. 53,8		B.
	Rigel.....	37,1	51,1	4,4	18,0	31,8	45,1	5. 6. 58,7		B.
	β Tauri.....	51,9	7,3	22,7	38,2	53,3	8,4	5. 16. 24,1		B.
	(h) γ 1 L.....	55,3	9,2	22,9	37,0	50,7	3,9	12. 39. 18,2		B.
	γ 2 L.....	59,9	13,8	27,5	41,4	55,5	9,1	12. 41. 22,9		B.
	g Virginis.....	14,9	28,2	42,0	55,7	9,8	23,0	12. 59. 36,7		B.
	Spica.....	29,8	43,4	57,1	11,0	24,9	38,2	13. 16. 51,7		B.
	Arcturus..... (blazing)	3,4	17,7	32,1	46,2	1,1	15,3	14. 8. 29,2		B.
	ε Bootis.....	38,4	53,7	8,9	24,1	39,7	54,6	14. 38. 9,9		B.
	Venus 2 L..... (hazy)	36,2	49,7	4,3	18,2	32,1	45,7	15. 12. 0,1		B.
	α Coronæ Borealis.....	33,1	48,3	3,7	18,9	34,1	48,7	15. 28. 4,2		B.
Dec. 28	α Arietis.....	49,9	5,3	20,1	34,7	49,2	3,9	1. 58. 18,2		B.
	α Ceti.....	39,7	53,1	6,9	20,2	34,0	47,1	2. 54. 0,8		B.
	Aldebaran.....	27,9	41,9	55,8	9,9	24,2	37,9	4. 26. 51,8		B.
	Rigel.....	35,5	49,1	2,9	16,3	30,2	43,4	5. 6. 57,1		B.
	β Tauri.....	50,2	5,5	21,0	36,1	51,8	6,9	5. 16. 22,0		B.
	(i) δ Ursæ Minoris SP....	11.33,2	15.19,8	19. 3,2	22.52,6	26.39,5	30.25,3	6. 34. 12,8		B.
	(k) γ 2 L.....	....	....	16,1	30,0	44,9	58,7	13. 26. 15,3	- 14,16	B.
	Arcturus.....	1,9	16,0	30,8	44,6	59,2	13,2	14. 8. 27,4		B.
Dec. 29	Arcturus..... (flaring)	59,8	14,3	29,2	42,8	57,1	11,1	14. 8. 25,4		B.
	(l) γ 2 L.....	1,0	15,3	29,8	44,0	58,3	13,1	14. 12. 27,3		B.
	(m) ε Bootis.....	34,9	50,1	5,3	20,4	35,9	51,0	14. 38. 6,1		B.
	Venus 2 L..... (hazy)	13,9	27,6	41,9	56,1	10,3	24,0	15. 20. 37,9		B.
	(n) δ Ursæ Minoris.....	11.32,8	....	....	....	....	....	18.....	+ 11. 18,90	B.
Dec. 31	Rigel.....	29,9	43,5	57,0	10,9	24,7	37,9	5. 6. 51,4		B.
	β Tauri..... (cloudy)	44,8	59,9	15,7	....	....	....	5. 15.....	+ 30,61	B.

ILLUMINATED END OF AXIS WEST. Order of Wires for Stars above the Pole, GFEDCBA.  
Transit levelled Dec. 31, 2<sup>h</sup>.

(a) Cloudy and wind very loud. (b) Wires badly illumined. (c) Wind too loud for the clock: counting found 1<sup>o</sup> in defect. Wires II and VII have each been increased 1<sup>o</sup>. (d) Blazing and wind very loud. (e) The stars are much coloured to-night. (f) Flaring immensely. Not used for clock error. (g) Very hazy and faint. Change of temperature after the 24th. (h) The dark limb being sufficiently visible was observed, but in a hurried manner, the observer not previously intending to take the observation. (i) Very steady. (k) Hurried and confused. The intervals are unsatisfactory. (l) Confused. (m) Wire VI was written 50,0 and is altered conjecturally. (n) Too cloudy for more wires. This single one was thought worth using.

Concluded Transit over the Mean of the seven Wires.	Seconds of Transit corr. for Errors of Level and Collimation.	Meridian Error.	Seconds of Transit corrected.	Tabular R.A. of Known Stars.	Clock apparently Slow.	Adopt- ed losing Rate.	Clock Slow at 0 <sup>h</sup> .	Apparent R.A. from the Observation.	NAME OF STAR or PLANET.
<i>h. m. s.</i>	<i>s.</i>	<i>"</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	
18. 7. 18,97 19. 42. 27,62 22. 57. 45,47 23. 59. 37,60 1. 57. 40,64 4. 26. 16,12 5. 6. 22,40 5. 15. 42,24 7. 30. 26,74 7. 35. 2,65 14. 7. 51,10	59,44	+ 2,47	19,24 27,90 45,74 37,89 40,92 16,39 22,68 42,53 27,01 2,93 51,37	57,61 7,72 10,85 46,32 52,73 12,72 56,97 32,88 21,74	29,71 29,83 29,93 29,93 30,05 30,19 29,96 29,95 30,37	1,09	28,69	18. 7. 48,75 19. 42. 57,48 22. 58. 15,47 0. 0. 7,67 1. 58. 10,79 4. 26. 46,37 5. 6. 52,69 5. 16. 12,55 7. 30. 57,13 7. 35. 33,05 14. 8. 21,79	☉ 1 L. α Aquilæ. Uranus. α Andromedæ. α Arietis. Aldebaran. Rigel. β Tauri. Procyon. Pollux. Arcturus.
15. 2. 46,43		+ 5,13	46,87			1,52	30,92	15. 3. 18,74	Venus 2 L.
18. 20. 33,97 18. 22. 56,62 18. 22. 56,69 2. 53. 21,88 4. 26. 11,61 5. 6. 18,03 5. 15. 37,99 12. 38. 36,74 12. 40. 41,44 12. 58. 55,76 13. 16. 10,87 14. 7. 46,43 14. 37. 24,18 15. 11. 18,05 15. 27. 18,72		}	45,76 56,19 22,29 11,99 18,46 38,36 37,17 41,87 56,19 11,30 46,81 24,55 18,49 19,09	29,86 56,55 46,33 52,75 12,75	33,67 34,26 34,34 34,29 34,39	1,59	32,44	18. 22. 19,42 18. 23. 29,85 2. 53. 56,51 4. 26. 46,31 5. 6. 52,83 5. 16. 12,74 12. 39. 12,08 12. 41. 16,79 12. 59. 31,13 13. 16. 46,26 14. 8. 21,83 14. 37. 59,61 15. 11. 53,59 15. 27. 54,21	☉'s center. δ Ursæ Minoris. α Ceti. Aldebaran. Rigel. β Tauri. γ 1 L. γ 2 L. γ Virginis. Spica. Arcturus. ε Bootis. Venus 2 L. α Coronæ Bor.
1. 57. 34,47 2. 53. 20,25 4. 26. 9,92 5. 6. 16,36 5. 15. 36,22 6. 22. 52,34 13. 25. 29,64 14. 7. 44,73			34,84 20,66 10,30 16,79 36,59 53,53 30,08 45,11	10,82 56,54 46,33 52,75 12,76 29,77 21,86	35,98 35,88 36,03 35,96 36,17 36,24		35,74	1. 58. 10,72 2. 53. 56,61 4. 26. 46,36 5. 6. 52,90 5. 16. 12,71 18. 23. 29,73 13. 26. 6,78 14. 8. 21,86	α Arietis. α Ceti. Aldebaran. Rigel. β Tauri. δ Ursæ Min. SP. γ 2 L. Arcturus.
14. 7. 42,81 14. 11. 44,11 14. 37. 20,53 15. 19. 55,96 18. 22. 51,70			43,17 44,55 20,87 56,39 50,85	21,90 59,70	38,73 38,83	1,93	37,62	14. 8. 21,82 14. 12. 23,21 14. 37. 59,56 15. 20. 35,24 18. 23. 29,95	Arcturus. γ 2 L. ε Bootis. Venus 2 L. δ Ursæ Minoris.
5. 6. 10,75 5. 15. 30,74			11,16 31,08	52,75 12,77	41,59 41,69	1,77	41,26	5. 6. 52,80 5. 16. 12,73	Rigel. β Tauri.

Error of Collimation = + 0",88. (By a reversion of the Transit Jan. 9, 1840, the Collimation Error before reversion was found to be + 1",10, which being nearly the same as that obtained on Sept. 19, the latter is used to the end of the year.)

Level Error = + 2",00. From Dec. 29 = + 1",62.

Meridian Error from Dec. 25 by the three observations of δ Ursæ Minoris alternately above and below the pole on Dec. 27, 28, and 30, no allowance being made for clock rate. This value agrees with one obtained by the bisection of Grantchester cross on reversing the Transit Jan. 9, 1840.





APPARENT RIGHT ASCENSIONS  
OF  
POLARIS AND  $\delta$  URSÆ MINORIS,  
AND  
MEAN RIGHT ASCENSIONS OF THE STARS  
OBSERVED IN THE YEAR 1839,  
AS DEDUCED FROM EACH DAY'S OBSERVATION;  
WITH  
A CATALOGUE  
OF THE  
CONCLUDED MEAN RIGHT ASCENSIONS,  
JANUARY 1, 1839.



## POLARIS.

Day of Observation.	Apparent R.A.	Mean R.A. Jan. 1, 1839.	Day of Observation.	Apparent R.A.	Mean R.A. Jan. 1, 1839.
1839.	<i>h.</i> <i>m.</i> <i>s.</i>	<i>h.</i> <i>m.</i> <i>s.</i>	1839.	<i>h.</i> <i>m.</i> <i>s.</i>	<i>h.</i> <i>m.</i> <i>s.</i>
January 8	1 . 1 . 30,13	1 . 1 . 51,15	June 25	1 . 1 . 32,08	1 . 1 . 53,94
9	30,70	52,43	26	33,24	53,84
10	31,02	53,45			
12	27,26	51,11	July 1	36,45	53,68
15	24,36	50,56	4	37,05	51,93
16	26,38	53,44	5	41,94	55,95
17	28,95	56,90	5	40,47	54,03
18	26,16	55,02	6	43,61	56,70
19	23,69	53,42	25	1 . 56,38	54,09
22	20,43	52,42			
30	15,17	53,13	August 1	2 . 0,95	53,78
31	15,47	54,26	2	1,92	53,93
February 13	7,05	54,74	September 17	29,50	55,57
15	1 . 5,64	54,81	18	27,53	53,46
March 9	0 . 52,74	52,58	18	26,59	52,39
9	52,58	52,58	19	28,93	54,50
11	52,46	53,02	20	27,48	52,95
11	52,11	52,86	20	25,97	51,35
19	51,20	54,23	25	27,99	52,21
26	46,80	51,00	26	28,88	52,75
27	46,40	50,88	26	28,92	52,62
April 1	49,46	54,14	27	29,63	52,99
10	49,25	53,48	30	30,47	53,21
11	49,24	53,44	30	30,60	53,27
15	49,40	52,63	October 1	28,79	51,35
16	51,85	54,76	2	30,94	53,42
17	52,04	54,80	4	31,06	53,44
19	52,27	54,55	7	29,86	51,93
19	52,34	54,52	10	30,95	52,55
23	50,03	51,40	10	31,08	52,60
24	51,12	52,23	11	30,12	51,50
25	50,92	51,88	13	30,58	51,81
28	55,29	54,86	14	30,64	51,86
29	56,81	55,89	15	31,71	52,94
30	55,39	54,23	15	32,14	53,40
30	54,04	52,64	16	32,52	53,82
			16	30,55	51,91
May 2	55,19	52,84	25	32,34	54,17
3	55,33	52,76	26	32,33	54,20
5	53,98	50,42	27	31,04	53,14
6	56,45	52,53	28	31,30	53,50
7	55,72	51,59	29	31,08	53,67
7	56,16	51,84	November 6	27,00	51,32
8	57,95	53,43	12	26,31	52,30
10	57,98	52,49	18	26,46	55,03
12	0 . 59,30	52,26	19	24,09	53,14
15	1 . 4,00	55,05	20	24,05	53,25
16	4,67	55,17	21	23,33	53,03
17	4,57	54,80	22	24,33	54,23
17	4,40	54,37	22	23,60	53,71
			23	21,08	51,42
June 5	17,33	54,83	26	23,29	55,58
9	21,19	55,41	28	22,59	55,76
10	21,65	55,44	29	20,02	54,05
11	22,25	54,79	30	19,86	54,17
12	22,69	54,83	30	19,63	54,21
16	27,60	56,54			
17	26,91	55,49	December 14	11,20	54,01
17	25,82	54,04	16	12,41	56,50
19	27,00	54,08	20	7,62	54,11
19	27,20	53,88			

## δ URSE MINORIS.

Day of Observation.	Apparent R.A.			Mean R.A. Jan. 1, 1839.	Day of Observation.	Apparent R.A.			Mean R.A. Jan. 1, 1839.
1839.	<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>h.</i> <i>m.</i> <i>s.</i>	1839.	<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>h.</i> <i>m.</i> <i>s.</i>
January 7	18	23	48,93	18 . 24 . 13,02	March 1	18	24	0,99	18 . 24 . 15,67
8			49,79	13,85					
9			50,67	14,71	August 1		20,46		15,40
9			51,62	15,65	1		20,24		15,32
14			50,36	14,31	2		20,06		15,27
15			50,39	14,31	2		19,92		15,27
15			50,38	14,28	4		19,62		15,59
16			51,30	15,14	5		18,97		15,28
17			51,14	14,94	6		18,78		15,25
17			51,20	14,95	7		18,09		14,90
19			50,40	13,96	8		17,77		14,89
21			50,55	13,78	8		17,45		14,73
23			50,48	13,46	12		16,57		14,88
28			51,10	13,51	20		14,46		15,49
29			51,46	13,72	20		13,98		15,20
					21		13,56		14,97
February 12			55,03	14,41					
14			55,59	14,59	September 1		8,52		14,18
14			55,79	14,65	3		7,85		14,15
15			55,98	14,70	4		7,64		14,37
16			55,71	14,14	6		5,91		13,44
18			55,41	13,23	9	24	4,53		13,19
19			57,12	14,65					
20			57,14	14,40	December 21	23	30,09		14,54
20			57,38	14,51	27		29,85		14,85
25			58,12	14,08	28		29,73		14,82
26			58,72	14,24	29		29,95		15,11
27			59,07	14,42					
27	23		59,48	14,67					



$\alpha$ ANDROMEDÆ.	$\delta$ Piscium.	$\alpha$ ARIETIS <i>continued.</i>	$\alpha$ CETI <i>continued.</i>
Jan. 8..... $\begin{smallmatrix} h. & m. & s. \\ 0. & 0. & 4,62 \end{smallmatrix}$	Dec. 15..... $\begin{smallmatrix} h. & m. & s. \\ 0. & 40. & 20,05 \end{smallmatrix}$	Jan. 24..... $\begin{smallmatrix} h. & m. & s. \\ 1. & 58. & 6,80 \end{smallmatrix}$	Nov. 21..... $\begin{smallmatrix} h. & m. & s. \\ 2. & 53. & 52,49 \end{smallmatrix}$
9 4,63		30 6,79	26 52,34
10 4,77	A.S.C. 91.	Feb. 13 6,74	28 52,25
12 4,81	April 6..... $\begin{smallmatrix} h. & m. & s. \\ 0. & 47. & 54,92 \end{smallmatrix}$	July 5 6,64	Dec. 14 52,33
15 4,84	Oct. 19 56,67	Oct. 11 6,59	20 52,16
16 4,66		19 6,83	27 52,23
18 4,66	$\epsilon$ Piscium.	26 6,72	28 52,34
22 4,90	Sept. 23..... $\begin{smallmatrix} h. & m. & s. \\ 0. & 54. & 35,53 \end{smallmatrix}$	28 6,63	$\delta$ Arietis.
30 4,81	Nov. 18 35,83	Nov. 18 6,60	Nov. 20..... $\begin{smallmatrix} h. & m. & s. \\ 3. & 2. & 26,13 \end{smallmatrix}$
31 4,71		20 6,91	14 Eridani.
Feb. 15 4,69	* N.P.D. $33^{\circ} 28'$ .	21 6,97	Dec. 14..... $\begin{smallmatrix} h. & m. & s. \\ 3. & 8. & 47,86 \end{smallmatrix}$
16 4,64	Oct. 14..... $\begin{smallmatrix} h. & m. & s. \\ 1. & 17. & 16,45 \end{smallmatrix}$	28 6,82	$\eta$ Tauri.
Aug. 25 4,84	* N.P.D. $33^{\circ} 32'$ .	Dec. 13 6,71	Aug. 2..... $\begin{smallmatrix} h. & m. & s. \\ 3. & 37. & 55,55 \end{smallmatrix}$
27 4,76	April 6..... $\begin{smallmatrix} h. & m. & s. \\ 1. & 17. & 50,87 \end{smallmatrix}$	14 6,68	Oct. 24 55,57
Sept. 17 4,71	Oct. 7 50,85	20 6,71	A <sup>1</sup> Tauri.
19 4,77	15 50,99	24 6,66	Aug. 2..... $\begin{smallmatrix} h. & m. & s. \\ 3. & 55. & 11,30 \end{smallmatrix}$
21 4,72	$\eta$ Piscium.	28 6,62	Oct. 24 11,30
22 4,71	Sept. 23..... $\begin{smallmatrix} h. & m. & s. \\ 1. & 22. & 52,65 \end{smallmatrix}$	$\theta^1$ Arietis.	Nov. 20 11,20
23 4,62	Dec. 16 52,69	Nov. 18..... $\begin{smallmatrix} h. & m. & s. \\ 2. & 9. & 10,80 \end{smallmatrix}$	21 11,16
26 4,63	$\nu$ Arietis.	A.S.C. 268.	$\nu^1$ Tauri.
28 4,67	$\circ$ Piscium.	Dec. 14..... $\begin{smallmatrix} h. & m. & s. \\ 2. & 27. & 15,76 \end{smallmatrix}$	Aug. 31..... $\begin{smallmatrix} h. & m. & s. \\ 4. & 16. & 41,12 \end{smallmatrix}$
30 4,80	Jan. 22..... $\begin{smallmatrix} h. & m. & s. \\ 1. & 36. & 53,99 \end{smallmatrix}$	Dec. 16..... $\begin{smallmatrix} h. & m. & s. \\ 2. & 29. & 41,25 \end{smallmatrix}$	Nov. 20 41,08
Oct. 1 4,68	Dec. 16 54,00	A.S.C. 279.	21 40,87
2 4,76	$\epsilon$ Cassiopeia.	Dec. 14..... $\begin{smallmatrix} h. & m. & s. \\ 2. & 31. & 46,92 \end{smallmatrix}$	ALDEBARAN.
19 4,73	Nov. 20..... $\begin{smallmatrix} h. & m. & s. \\ 1. & 42. & 53,31 \end{smallmatrix}$	$\pi$ Arietis.	Jan. 8..... $\begin{smallmatrix} h. & m. & s. \\ 4. & 26. & 41,52 \end{smallmatrix}$
28 4,79	$\gamma^1$ Arietis.	Jan. 22..... $\begin{smallmatrix} h. & m. & s. \\ 2. & 40. & 18,98 \end{smallmatrix}$	9 41,37
Nov. 6 4,71	Jan. 22..... $\begin{smallmatrix} h. & m. & s. \\ 1. & 44. & 42,36 \end{smallmatrix}$	$\epsilon$ Arietis.	14 41,28
12 4,75	$\beta$ Arietis.	Jan. 22..... $\begin{smallmatrix} h. & m. & s. \\ 2. & 50. & 1,06 \end{smallmatrix}$	15 41,39
16 4,65	July 5..... $\begin{smallmatrix} h. & m. & s. \\ 1. & 45. & 45,55 \end{smallmatrix}$	Nov. 20 1,24	16 41,48
18 4,66	Nov. 18 45,52	$\alpha$ CETI.	18 41,54
20 4,77	$\alpha$ ARIETIS.	Jan. 22..... $\begin{smallmatrix} h. & m. & s. \\ 2. & 53. & 52,32 \end{smallmatrix}$	19 41,32
22 4,71	Jan. 17..... $\begin{smallmatrix} h. & m. & s. \\ 1. & 58. & 6,77 \end{smallmatrix}$	24 52,33	Feb. 23 41,41
25 4,73	19 6,54	Feb. 15 52,16	25 41,60
Dec. 7 4,84	22 6,63	19 52,14	Mar. 8 41,38
13 4,67		Nov. 11 52,64	26 41,32
14 4,63		18 52,43	April 10 41,27
24 4,66		20 52,35	11 41,35
$\beta$ Cassiopeia.			17 41,22
Oct. 7..... $\begin{smallmatrix} h. & m. & s. \\ 0. & 0. & 37,41 \end{smallmatrix}$			19 41,39
$d$ Piscium.			24 41,47
Sept. 22..... $\begin{smallmatrix} h. & m. & s. \\ 0. & 12. & 19,22 \end{smallmatrix}$			May 6 41,26
23 19,13			7 41,48
Nov. 16 19,15			8 41,56
$\kappa$ Cassiopeia.			
Oct. 7..... $\begin{smallmatrix} h. & m. & s. \\ 0. & 23. & 53,97 \end{smallmatrix}$			
10 54,16			
14 54,20			
A.S.C. 55.			
Oct. 15..... $\begin{smallmatrix} h. & m. & s. \\ 0. & 29. & 4,22 \end{smallmatrix}$			
16 4,09			
19 4,20			

ALDEBARAN <i>continued.</i>	$\beta$ TAURI.	$\kappa$ Aurigæ.	CASTOR <i>continued.</i>
June 9..... <sup>h. m. s.</sup> 4. 26. 41,44 16 41,34	Jan. 9..... <sup>h. m. s.</sup> 5. 16. 7,25 14 7,26 15 7,21 16 7,33 17 7,29 19 7,18 24 7,10	Nov. 22..... <sup>h. m. s.</sup> 6. 5. 7,05 Dec. 20 7,08	June 11..... <sup>h. m. s.</sup> 7. 24. 18,89 12 19,01 17 18,99
Aug. 31 41,41	Feb. 14 7,22 16 7,25 19 7,31 21 7,24 23 7,07 27 7,16	$\epsilon$ Geminorum.	July 31 19,01
Oct. 24 41,36	Mar. 8 7,05	Feb. 23.....6. 34. 1,54 Mar. 6 1,37 April 19 1,23	Aug. 1 18,98 2 19,13 4 19,06 12 19,01 15 19,13 20 19,16
Nov. 21 41,12 22 41,59	April 10 7,14 11 7,06 19 7,19 25 7,15	$\tau$ Geminorum.	Sept. 1 19,12 5 19,08 6 19,12 29 19,08
Dec. 13 41,49 14 41,47 20 41,48 24 41,42 27 41,35 28 41,40	May 7 7,04 16 7,16 18 7,16	Dec. 20.....7. 0. 53,00	Dec. 20. .... 19,09
$\tau$ Tauri.	July 5 7,03 12 7,12	$\delta$ Geminorum.	PROCYON.
Oct. 24.....4. 32. 35,18	Aug. 2 7,17 4 7,21 31 7,29	Dec. 20.....7. 10. 29,99	Feb. 11.....7. 30. 52,10 13 52,25 14 52,10 15 52,22 16 52,16 18 52,12 20 52,21 23 52,18 25 52,23 27 52,33
$\iota$ Tauri.	Nov. 21 7,07 22 7,11	$\iota$ Geminorum.	Mar. 6 52,12 8 52,31 9 52,16 11 52,14 12 52,22 16 52,27 19 52,20 20 52,22 24 52,20 25 52,12 26 52,30
Oct. 24.....4. 53. 28,53	Dec. 20 6,90 24 6,97 27 7,13 28 7,09 31 7,10	Feb. 23.....7. 15. 43,27 24 43,13 25 43,24 Sept. 29 43,14	April 10 52,28 11 52,32 19 52,20 24 52,14 25 52,20 26 52,25
RIGEL.	$l$ Aurigæ.	CASTOR.	May 3 52,17 7 52,18 8 52,20 27 52,26 28 52,15 29 52,16 30 52,29
Jan. 9.....5. 6. 48,31 14 48,23 15 48,25 16 48,36 17 48,32 19 48,46 24 48,29	Nov. 22.....5. 28. 18,22	Feb. 13.....7. 24. 19,12 14 19,13 15 19,10 16 19,07 18 19,17 20 19,11 23 19,29 25 19,05 27 19,20	June 1 52,28 6 52,15 17 52,32 24 52,01 25 52,22 28 52,21
Feb. 16 48,19 21 48,43 27 48,26	C Tauri.	Mar. 6 19,05 8 19,12 9 19,05 11 19,06 12 18,99 16 19,01 20 19,13 24 19,07 25 19,05	July 6 52,26 11 52,49 14 51,95
Mar. 8 48,22	Aug. 31.....5. 43. 12,61 Dec. 20 12,44	April 10 19,11 11 18,90 19 18,96 24 18,93 25 19,04 26 19,06	Aug. 1 52,24
April 10 48,28 11 48,15 19 48,10 24 48,35 25 48,26	$\alpha$ ORIONIS.	May 3 18,98 7 18,83 8 18,87 28 18,89 29 18,95 30 18,57	
May 4 48,24 8 48,36 16 48,18 18 48,26	Jan. 17.....5. 46. 27,49	June 6. .... 19,07	
June 20 48,21 26 48,24	Feb. 14 27,46 15 27,54 19 27,44 20 27,46 25 27,58 27 27,34		
July 5 48,09 10 47,95 12 48,29	Mar. 1 27,50 8 27,41 25 27,46		
Aug. 4 48,28 31 48,18	Aug. 31 27,37 Dec. 20 27,46		
Nov. 21 48,06 22 48,44			
Dec. 20 48,35 24 48,20 27 48,32 28 48,39 31 48,29			



PROCYON <i>continued.</i>				POLLUX <i>continued.</i>				* (g) N.P.D. 68°. 31'.				* (o) N.P.D. 69°. 17'.			
Aug.	2.....	h. m. s. 7. 30. 52,12		Sept.	6.....	h. m. s. 7. 35. 27,45		April	6.....	h. m. s. 9. 9. 26,54		April	6.....	h. m. s. 9. 22. 40,50	
	4	52,10			12	27,28			10	26,62			10	40,47	
	12	52,17			16	27,45							19	40,39	
					29	27,32		q Cancri.				14 Leonis.			
Sept.	1	52,14			30	27,12		Mar. 24. .... 9. 9. 59,16				Jan. 29..... 9. 32. 33,17			
	5	52,12						25 59,27				Feb. 25 33,11			
	6	52,14			Dec. 20	27,21		* (h) N.P.D. 68°. 47'.				27 32,97			
	16	52,23			24	27,46		April 19..... 9. 10. 30,51				ψ Leonis.			
	29	52,30		6 Cancri.				* N.P.D. 68°. 57'.				April 22..... 9. 34. 57,59			
	30	52,33		Mar. 24..... 7. 53. 37,05				April 6..... 9. 14. 41,82				ν Leonis.			
Dec. 20		52,35		λ Cancri.				9 41,73				Mar. 25..... 9. 49. 33,47			
24		52,38		Feb. 25..... 8. 10. 57,05				10 41,70							
				27 57,11				19 41,54							
POLLUX.				θ Cancri.				* (k) N.P.D. 70°. 15'.				η Leonis.			
Feb. 11.....	7. 35.	27,41		Mar. 24..... 8. 22. 24,62				April 19..... 9. 17. 31,59				Mar. 25..... 9. 58. 32,89			
13		27,49		γ Cancri.				α HYDRÆ.				REGULUS.			
14		27,32		Feb. 25..... 8. 33. 57,80				Jan. 29..... 9. 19. 40,57				Jan. 29..... 9. 59. 47,54			
15		27,46		27 57,56				Feb. 23 40,54				Feb. 23 47,35			
16		27,33		δ Cancri.				25 40,63				25 47,36			
18		27,28		April 21..... 8. 35. 31,76				27 40,70				26 47,51			
20		27,26		May 17 31,59				Mar. 6 40,74				27 47,46			
23		27,30		* (a) N.P.D. 68°. 2'.				9 40,58				Mar. 1 47,50			
25		27,24		Mar. 25..... 8. 48. 9,42				15 40,65				6 47,41			
27		27,27		April 6 9,55				19 40,61				8 47,52			
Mar. 6		27,35		* (d) N.P.D. 68°. 21'.				21 40,47				9 47,52			
8		27,41		April 6..... 8. 58. 30,58				24 40,75				13 47,48			
9		27,53		ξ Cancri.				25 40,76				15 47,44			
11		27,32		Jan. 29..... 9. 0. 5,65				April 9 40,59				19 47,39			
12		27,34		Mar. 24 5,44				19 40,64				24 47,39			
16		27,26		25 5,67				21 40,64				April 6 47,44			
19		27,34		April 21 5,59				22 40,52				19 47,52			
20		27,16		22 5,49				24 40,56				21 47,45			
24		27,26		* (e) N.P.D. 68°. 40'.				25 40,54				22 47,63			
25		27,29		April 6..... 9. 3. 32,03				29 40,51				24 47,58			
26		27,26						May 3 40,68				25 47,60			
April 10		27,22						* (l) N.P.D. 70°. 1'.				26 47,56			
19		27,16						April 6..... 9. 19. 57,68				29 47,49			
24		27,28						10 57,70				30 47,50			
25		27,23						λ Leonis.				May 3 47,47			
26		27,21										7 47,53			
May 3		27,28										8 47,49			
7		27,08										17 47,38			
8		27,07										21 47,47			
27		27,48										30 47,76			
28		27,27										June 16 47,34			
29		27,16										17 47,35			
30		27,19										20 47,67			
June 1		27,21										July 6 47,48			
6		27,28										13 47,49			
17		27,37										Aug. 2 47,66			
20		27,14													
21		27,27													
July 6		27,39													
Aug. 1		27,27													
2		27,16													
4		27,19													
8		27,26													
12		27,36													
15		27,25													
20		27,39													
Sept. 1		27,33													
5		27,28													

REGULUS continued.	$\beta$ LEONIS.	$\kappa$ Draconis.	$\alpha$ Virginis.
Sept. 17.....9. 59. 47,39 18 47,41 26 47,43 29 47,42	Feb. 23.....11. 40. 50,56 25 50,69 26 50,58 27 50,50 28 50,70	Mar. 27.....12. 26. 34,19 April 6 34,53 11 34,02 19 34,21	April 17.....13. 34. 58,41 25 58,47 30 58,45 May 1 58,59
$\gamma$ Leonis.	Mar. 8 50,52 9 50,43 11 50,64 13 50,62 19 50,68 27 50,59	$\gamma^1$ Virginis.	$\alpha$ Virginis.
Feb. 26.....10. 11. 5,25 27 5,11	April 1 50,59 6 50,67 11 50,80 19 50,72 22 50,53 30 50,53	April 25.....12. 33. 30,50 Nov. 29 30,68	May 25.....13. 41. 8,08 26 8,26
$\rho$ Leonis.	May 2 50,96 3 50,69 7 50,70 8 50,72 10 50,72 11 50,65 17 50,55 18 50,55 20 50,53 25 50,60 27 50,50 28 50,66 29 50,67 30 50,87	42 Virginis(?) * N.P.D. 81°. 17'.	ARCTURUS.
Mar. 27.....10. 24. 19,78	June 1 50,60 5 50,59 10 50,51 12 50,63 17 50,60 22 50,59	Mar. 27.....12. 47. 7,13	April 5.....14. 8. 19,24 17 19,33 19 19,29 20 19,28 29 19,25 30 19,24
$\iota$ Leonis.	July 5 50,58	$g$ Virginis.	May 1 19,36 3 19,37 7 19,33 10 19,18
Feb. 27.....10. 40. 47,41	Aug. 9 50,61 10 50,42	Dec. 27.....12. 59. 27,99	June 4 19,32
Mar. 6 47,34 27 47,34	Oct. 2 50,61 15 50,68 28 50,52	$\beta$ Virginis.	July 11 19,23 18 19,17
* N.P.D. 26°. 12'.	$\beta$ Virginis.	Mar. 27.....12. 47. 7,13	Sept. 9 19,22 18 19,35 20 19,27 25 19,06
April 1.....10. 44. 38,48 16 38,06 19 38,12 25 38,07	April 25.....11. 42. 18,70 May 21 18,62	$\kappa$ Draconis.	Oct. 3 19,25 5 19,27 11 19,16 16 19,24 17 19,27 26 19,06 29 19,18
* N.P.D. 26°. 1'.	$\alpha$ Virginis.	Mar. 20.....13. 16. 43,27 21 43,38	Nov. 19 19,18 21 19,13 26 19,26 29 19,22 30 19,32
April 1.....10. 52. 23,38 6 23,69	$\gamma$ Virginis.	April 5 43,27 17 43,32 20 43,24 25 43,28 29 43,32 30 43,33	Dec. 3 19,36 12 19,24 24 19,32 27 19,27 28 19,27 29 19,19
$\chi$ Leonis.	$\eta$ Virginis.	May 1 43,35 3 43,32 7 43,38 20 43,48 21 43,21 25 43,28 27 43,37 28 43,41 29 43,40	$\lambda$ Virginis.
Feb. 27.....10. 56. 42,44 28 42,60	Mar. 1.....12. 11. 40,54 11 40,31	June 22 43,13	April 27.....14. 10. 24,52 28 24,47
April 24 42,72 25 42,68	$\zeta$ Virginis.	July 11 43,30 15 43,18	$t$ Bootis.
* N.P.D. 26°. 38'.	$\nu$ Leonis.	Aug. 1 43,27 2 43,16 5 43,19	April 17.....14. 11. 28,90 19 28,81 20 28,79
April 1.....11. 16. 47,56 6 48,27 19 47,44	Mar. 27.....11. 28. 42,41	Nov. 30 43,20 Dec. 27 43,19	
$\tau$ Leonis.		78 Virginis.	
April 24.....11. 19. 39,62 25 39,48		May 1.....13. 25. 58,80 21 58,58 25 58,60 27 58,57	
$\nu$ Leonis.			



10 Hydræ Con.	* N.P.D. 97°. 16'.	θ Ursæ Minoris continued.	δ OPHIUCHI continued.
April 30..... <sup>h. m. s.</sup> 14. 36. 41,94	May 25..... <sup>h. m. s.</sup> 15. 6. 49,57	May 3..... <sup>h. m. s.</sup> 15. 36. 19,71	June 11..... <sup>h. m. s.</sup> 16. 5. 54,96
May 3 42,00	* N.P.D. 97°. 16'.	21 19,52	12 54,95
7 42,00	May 3.....15. 8. 37,55	25 20,00	15 55,08
17 41,86	17 37,57	α SERPENTIS.	16 54,97
ε BOOTIS.	21 37,57	May 6.....15. 36. 20,57	22 54,95
April 27.....14. 37. 57,40	25 37,47	26 20,68	24 55,00
28 57,36	27 37,47	27 20,50	July 1 54,97
29 57,34	28 37,65	June 8 20,66	3 54,91
May 14 57,50	* N.P.D. 106°. 53'.	Aug. 23 20,52	4 54,90
June 19 57,49	May 3.....15. 20. 28,91	Sept. 13 20,53	5 54,80
Nov. 29 57,31	17 29,04	δ SCORPII.	6 54,99
30 57,36	21 29,00	May 26.....15. 41. 18,51	15 55,32
Dec. 3 57,27	25 29,03	27 18,52	18 54,88
12 57,31	27 29,14	σ SCORPII.	20 55,03
27 57,35	28 29,16	May 27.....16. 11. 24,86	22 54,96
29 57,23	June 1 29,02	ANTARES.	Aug. 1 54,94
11 Hydræ Con.	α CORONÆ BOREALIS.	δ SCORPII.	
May 20.....14. 38. 1,74	May 26.....15. 27. 52,51	April 29.....15. 50. 49,49	
21 1,74	27 52,30	30 49,43	
25 1,78	June 6 52,43	θ DRACONIS.	May 3.....16. 19. 32,83
A.S.C. 1673.	7 52,41	May 3.....15. 58. 52,79	6 33,02
May 27.....14. 38. 5,33	8 52,46	17 52,86	11 32,93
28 5,43	18 52,40	21 52,90	14 32,97
29 5,63	Aug. 23 52,46	A.S.C. 1848.	15 32,77
α <sup>s</sup> LIBRÆ.	Sept. 13 52,42	May 25.....16. 1. 2,86	16 32,72
April 27.....14. 41. 59,03	Nov. 4 52,44	27 2,77	17 32,96
28 59,07	Dec. 12 52,39	16 SCORPII.	21 32,87
29 59,14	20 52,26	June 1.....16. 3. 24,27	22 32,83
30 59,04	22 52,52	8 24,42	27 32,83
May 1 58,87	27 52,34	τ <sup>s</sup> SERPENTIS.	June 19 33,20
3 58,97	May 17.....15. 29. 4,62	May 17.....15. 29. 4,62	21 33,15
7 59,16	21 4,27	25 4,40	July 3 32,90
14 59,17	June 1 4,25	48 SERPENTIS.	6 32,91
17 59,05	φ LIBRÆ.	May 3.....16. 4. 11,45	15 32,75
20 58,88	June 19.....15. 29. 39,11	25 11,67	16 32,96
21 58,99	χ LIBRÆ.	T HERCULIS.	18 32,75
25 58,96	April 29.....15. 30. 46,83	June 19.....16. 4. 46,98	20 32,81
26 58,89	May 26 46,54	δ OPHIUCHI.	21 32,83
June 6 59,08	27 46,70	May 6.....16. 5. 54,93	22 32,75
7 59,06	θ URSAE MINORIS.	10 54,77	24 32,87
19 58,81	April 30.....15. 36. 19,30	15 55,02	Aug. 1 32,80
Aug. 16 59,00		16 55,05	2 32,70
Dec. 22 58,94		17 55,18	8 32,88
20 LIBRÆ.		21 55,04	10 32,90
April 28.....14. 54. 39,74		22 54,96	20 32,89
29 39,74			21 32,90
			23 33,00
			Nov. 4 32,80
			n HERCULIS.
			May 3.....16. 24. 40,50
			June 8 40,70
			19 40,68

$\tau$ Scorpii.	$\alpha$ HERCULIS <i>continued.</i>	$\alpha$ OPHIUCHI <i>continued.</i>	* N.P.D. 48°. 16'.
July 22..... <sup>h. m. s.</sup> 16. 25. 52,29	June 1..... <sup>h. m. s.</sup> 17. 7. 18,58	Jan. 9..... <sup>h. m. s.</sup> 17. 27. 27,92	Aug. 8..... <sup>h. m. s.</sup> 17. 46. 30,67
* N.P.D. 80°. 11'.	4 18,56	14 27,74	$\theta$ Herculis.
May 25.....16. 30. 15,77	15 18,42	15 27,65	June 24.....17. 50. 44,06
27 15,69	16 18,57	16 27,79	July 3 44,21
June 1 15,55	19 18,52	17 27,79	4 43,93
8 15,62	July 1 18,52	21 27,76	5 43,83
$\zeta$ Herculis.	4 18,50	May 29 27,88	6 44,10
May 17.....16. 38. 6,39	16 18,58	June 4 27,82	$\gamma$ Draconis.
25 6,59	22 18,41	8 27,74	July 12.....17. 52. 52,18
27 6,20	24 18,67	12 27,69	18 52,27
$\epsilon$ Ophiuchi.	Aug. 1 18,65	15 27,75	22 52,37
May 17.....16. 46. 23,68	2 18,56	16 27,87	$\eta$ Sagittarii.
25 23,75	7 18,41	19 27,80	July 15.....17. 54. 0,28
27 23,65	8 18,65	21 27,72	Aug. 1 0,28
A.S.C. 1949.	10 18,40	24 27,85	8 0,45
May 25.....16. 55. 13,45	17 18,50	July 1 27,72	10 0,36
27 13,47	20 18,38	3 27,81	$\gamma^2$ Sagittarii.
* N.P.D. 76°. 10'.	21 18,49	4 27,83	Aug. 20.....17. 55. 28,09
May 17 .....16. 56. 15,53	22 18,47	5 27,88	* N.P.D. 44°. 18'.
29 15,38	Sept. 4 18,63	6 27,88	July 3.....18. 0. 30,07
June 1 15,65	Nov. 26 18,42	12 27,84	5 29,96
8 15,64	Dec. 20 18,53	15 27,89	6 30,03
29 Scorpii.	$\theta$ Ophiuchi.	22 27,71	18 30,07
July 3.....17. 4. 12,99	May 29.....17. 12. 7,81	23 27,84	20 30,08
15 13,00	July 22 7,72	30 27,88	Aug. 1 30,11
A Ophiuchi.	* N.P.D. 61°. 0'.	Aug. 8 27,87	$\delta$ Sagittarii.
May 29.....17. 5. 27,73	June 8.....17. 12. 30,07	10 27,79	May 29.....18. 10. 41,26
June 24 27,54	July 1 30,03	17 27,92	Aug. 20 41,49
$\alpha$ HERCULIS.	$\rho$ Herculis.	20 27,80	$\lambda$ Sagittarii.
Jan. 8.....17. 7. 18,50	May 29.....17. 18. 8,03	21 27,78	May 29.....18. 18. 2,07
9 18,60	June 8 7,97	22 27,80	A.S.C. 2151.
14 18,68	* N.P.D. 57°. 11'.	23 27,84	July 3.....18. 28. (29,58)
15 18,36	June 15.....17. 18. 41,10	30 27,85	15 30,44
16 18,32	19 40,90	Nov. 20 27,81	Aug. 10 30,61
Feb. 12 18,39	July 1 40,97	23 27,81	* N.P.D. 38°. 21'.
May 14 18,34	3 41,00	26 27,72	July 18.....18. 30. 46,80
15 18,55	6 41,03	Dec. 5 27,97	
16 18,66	18 41,02	15 27,87	
17 18,42	* N.P.D. 55°. 3'.	20 27,83	
25 18,61	July 18.....17. 26. 7,14	July 22.....17. 37. 25,91	
27 18,64	Aug. 1 7,29	Sept. 15 25,75	
	2 7,32	* N.P.D. 48°. 12'.	
	$\alpha$ OPHIUCHI.	July 1.....17. 46. 7,96	
	Jan. 7.....17. 27. 27,78	3 8,07	
	8 27,77	6 7,76	
		15 7,78	
		18 7,87	



$\sigma$ Sagittarii.	$\alpha$ AQUILÆ continued.	$\beta$ AQUILÆ continued.	$\alpha^2$ CAPRICORNI continued.
Aug. 20.....18.45.16,85 21 16,91	Aug. 5.....19.42.55,78 7 55,81 8 55,72 10 55,96 19 55,68 20 55,88 21 55,74 22 55,68 28 55,68 30 55,64	Aug. 10.....19.47.24,46 19 24,35 20 24,32 21 24,39 22 24,51 30 24,34 Sept. 4 24,32 6 24,31 9 24,34 13 24,38 15 24,33 21 24,30 23 24,35 25 24,34 27 24,44 28 24,34 30 24,33 Oct. 1 24,37 7 24,23 10 24,34 14 24,28 15 24,24 16 24,30 18 24,27 26 24,22 29 24,33 30 24,38 Nov. 4 24,31 11 24,24 16 24,32 20 24,25 22 24,20 23 24,44 26 24,33 Dec. 5 24,26	Sept. 27.....20.9.6,95 28 7,09 30 7,09 Oct. 7 7,15 11 7,18 14 7,12 18 7,07 19 7,19 26 7,08 Nov. 4 7,00 11 6,94 16 7,03 20 6,95 22 6,96 23 6,95 26 7,17
* N.P.D. 87°.44'.			
July 20.....18.48.19,74			
Sept. 3 19,51 9 19,49			
64 Serpentis.			
Aug. 8.....18.49.10,95 22 10,94			
$\tau$ Sagittarii.			
Aug. 20.....18.56.53,27 21 53,12			
A.S.C. 2212.			
Sept. 9.....18.57.22,44			
O Sagittarii.			
Sept. 9.....19.16.45,60			
$h^2$ Sagittarii.			
Sept. 18.....19.26.54,41			
Oct. 14 54,25			
$\alpha$ AQUILÆ.			
Jan. 8.....19.42.55,67 10 55,57 12 55,60 14 55,49 15 55,69 17 55,63 21 55,62 23 55,56 29 55,53			
Feb. 1 55,70 12 55,54 14 55,60 20 55,43 24 55,46 27 55,58			
July 16 55,74 18 55,84 20 55,66 21 55,55 22 55,92 25 55,70			
Aug. 2 55,83 3 55,74			
	Sept. 4 55,71 6 55,60 9 55,74 13 55,64 15 55,66 18 55,76 21 55,90 23 55,81 25 55,69 27 55,78 28 55,74 30 55,66 Oct. 1 55,77 7 55,74 10 55,77 11 55,83 12 55,70 14 55,83 15 55,80 16 55,72 18 55,75 26 56,00 29 55,77 30 55,69 Nov. 4 55,88 11 55,52 13 55,70 16 55,70 20 55,70 22 55,70 23 55,75 26 55,73 Dec. 5 55,68 14 55,65 17 55,66 21 55,80 24 55,57		
	59 Sagittarii.		
	Sept. 18.....19.47.3,59		
	$\beta$ AQUILÆ.		
	July 16.....19.47.24,28 18 24,42 20 24,32 21 24,45 22 24,46		
	Aug. 1 24,23 2 24,34 3 24,32 5 24,31 6 (24,70) 7 24,43 8 24,29		
		Aug. 21.....19.52.45,11 22 45,02 Oct. 15 45,09 16 44,99	
		$c$ Sagittarii.	
		Aug. 21.....19.52.45,11 22 45,02 Oct. 15 45,09 16 44,99	
		$\alpha^2$ CAPRICORNI.	
		July 21.....20.9.7,21 22 7,10 Aug. 1 7,14 2 7,16 3 7,15 5 7,15 7 7,05 8 7,06 10 7,11 12 7,03 19 7,07 20 7,09 Sept. 6 7,20 9 7,17 15 7,12 18 7,04 21 6,96 23 6,93 25 7,28 26 7,01	
			$\sigma$ Capricorni.
			Aug. 21.....20.10.5,79 Oct. 15 5,79 16 6,07
			$\pi$ Capricorni.
			Sept. 18.....20.18.6,00
			* N.P.D. 26°.38'.
			Aug. 5.....20.24.8,88 8 (8,03) 20 8,70 21 9,04 Oct. 7 8,83 14 8,95
			$\psi$ Capricorni.
			Sept. 18.....20.36.33,06 Nov. 13 33,45
			$\eta$ Capricorni.
			Aug. 22.....20.55.14,22 Oct. 16 14,28
			* N.P.D. 60°.26'.
			Aug. 5.....21.1.6,55 10 6,54
			* N.P.D. 60°.26'.
			Aug. 8.....21.1.49,42 12 49,19 27 49,40

* N.P.D. 25°. 0'.	$\beta$ AQUARIi <i>continued.</i>	* N.P.D. 24°. 20'. <i>continued.</i>	$\kappa^1$ PISCII <i>continued.</i>
Aug. 20.....21. 2. 22,54 21 22,19	Dec. 5.....21. 23. 4,82 7 4,73	Aug. 20.....22. 35. 24,00 21 24,02 27 23,93	Sept. 22.....23. 18. 40,91 Nov. 16 40,91
Oct. 10 22,17 14 21,82 15 21,50	$\gamma$ Capricorni.	Oct. 10 24,09 14 24,18 15 24,11	$\delta$ Cephei.
* N.P.D. 25°. 2'.	Sept. 19.....21. 31. 9,81	$\epsilon$ Cephei.	Aug. 27.....23. 20. 30,47 29 30,41
April 10.....21. 2. 39,16	$\delta$ Capricorni.	Aug. 10.....22. 43. 58,01 22 58,08 27 58,05	Sept. 17 30,87 Oct. 7 30,43
$\epsilon$ Capricorni.	Aug. 23.....21. 38. 9,01	Oct. 7 57,92	$\gamma$ Cephei.
Aug. 22.....21. 6. 49,74 Oct. 16 50,01	Sept. 19 8,90 Oct. 18 9,01	$\lambda$ Aquarii.	Aug. 27.....23. 32. 47,69 29 47,52
* N.P.D. 76°. 45'.	$\alpha$ AQUARIi.	Aug. 24.....22. 44. 12,70 25 12,86	Sept. 17 47,88 Oct. 7 47,73
Aug. 10.....21. 8. 57,29	Aug. 12.....21. 57. 31,00 25 30,80 27 30,90	Oct. 19 12,86 Dec. 12 12,63	$\lambda$ PISCII.
* N.P.D. 76°. 43'.	Sept. 4 30,86 6 30,88 7 30,76 19 30,90 21 30,95 23 30,86 26 30,96	$\alpha$ PEGASI.	Aug. 25.....23. 33. 50,02 Oct. 19 49,92 20 49,88
Aug. 5.....21. 9. 14,78 8 14,79 27 14,81	Oct. 19 30,86 29 30,87	Aug. 20.....22. 56. 44,89 21 44,69 22 44,74 23 44,75 24 44,77 25 44,79 27 44,75 29 44,77	$\omega$ PISCII.
* N.P.D. 75°. 23'.	Nov. 4 30,91 12 30,83 16 30,89 20 30,96	Sept. 6 44,82 9 44,77 12 44,77 13 44,87 17 44,63 19 44,83 21 44,76 22 44,79 23 44,96 26 44,80 28 44,75 30 44,75	Sept. 22.....23. 51. 2,81 23 3,01 Nov. 16 2,92
Aug. 8.....21. 20. 3,49 10 3,16 20 3,39	Dec. 5 30,84 16 30,83 17 30,91	Oct. 2 44,73 7 44,75 20 44,78	$q$ PISCII.
Oct. 10 2,90 14 3,54 15 3,80	$\epsilon$ Aquarii.	$\phi$ Aquarii.	Aug. 25.....23. 53. 34,62 Oct. 19 34,48
$\beta$ AQUARIi.	Aug. 23.....21. 57. 44,24	Sept. 21.....23. 5. 59,07 22 59,07	* N.P.D. 25°. 26'.
Aug. 12.....21. 23. 4,76 25 4,79 27 4,82 28 4,87	$\theta$ Aquarii.	Nov. 16 59,10 Dec. 12 58,82	Aug. 27.....23. 53. 39,26 Oct. 7 38,84 14 39,36 16 39,27
Sept. 2 4,81 3 4,85 4 4,81 7 4,81 19 4,77 21 4,87 23 4,74 26 4,88	Sept. 21.....22. 8. 19,98 Dec. 12 20,02	$\kappa^1$ PISCII.	* N.P.D. 26°. 22'.
Oct. 1 4,84 18 4,86 19 4,70	$\sigma$ Aquarii.	Sept. 21.....23. 5. 59,07 22 59,07	Nov. 20.....23. 54. 16,28 23 16,22
Nov. 4 4,83 16 4,94 20 4,75 25 4,93 26 4,90	* N.P.D. 24°. 20'.	Oct. 2 44,73 7 44,75 20 44,78	* N.P.D. 26°. 42'.
	April 6.....22. 35. 24,43	Sept. 21.....23. 18. 40,83	Oct. 10.....23. 58. 7,36 14 7,65 15 7,44



CATALOGUE OF THE CONCLUDED MEAN RIGHT ASCENSIONS, JAN. 1, 1839;  
WITH THE ANNUAL VARIATIONS.

Name of Star.	Number of Obser- vations.	Mean R.A. Jan. 1, 1839.	Annual Variation.	Name of Star.	Number of Obser- vations.	Mean R.A. Jan. 1, 1839.	Annual Variation.
		<i>h. m. s.</i>	<i>s.</i>			<i>h. m. s.</i>	<i>s.</i>
$\alpha$ ANDROMEDÆ.....	37	0. 0. 47,2	+ 3,071	$\alpha$ HYDRÆ.....	19	9. 19. 40,61	+ 2,950
$\beta$ Cassiopeiæ.....	1	0. 0. 37,41	+ 3,124	* ( <i>l</i> ) N.P.D. 70°. 1'.	2	9. 19. 57,69	+ 3,381
$\delta$ Piscium.....	3	0. 12. 19,17	+ 3,077	$\lambda$ Leonis.....	5	9. 22. 31,44	+ 3,441
$\kappa$ Cassiopeiæ.....	3	0. 23. 54,11	+ 3,324	* ( <i>o</i> ) N.P.D. 69°. 17'	3	9. 22. 40,45	+ 3,389
A.S.C. 55.....	3	0. 29. 4,17	+ 2,988	14 Leonis.....	3	9. 32. 33,08	+ 3,219
$\delta$ Piscium.....	1	0. 40. 20,05	+ 3,095	$\psi$ Leonis.....	1	9. 34. 57,59	+ 3,277
A.S.C. 91.....	2	0. 47. 55,80	+ 6,396	$\nu$ Leonis.....	1	9. 49. 33,47	+ 3,238
$\epsilon$ Piscium.....	2	0. 54. 35,68	+ 3,106	$\eta$ Leonis.....	1	9. 58. 32,89	+ 3,283
POLARIS.....	116	1. 1. 53,49	+ 16,398	REGULUS.....	38	9. 59. 47,48	+ 3,222
* N.P.D. 33°. 28'...	1	1. 17. 16,45	+ 3,768	$\gamma$ Leonis.....	2	10. 11. 5,18	+ 3,300
* N.P.D. 33°. 32'...	3	1. 17. 50,90	+ 3,740	$\rho$ Leonis.....	1	10. 24. 19,78	+ 3,166
$\eta$ Piscium.....	2	1. 22. 52,67	+ 3,189	$\iota$ Leonis.....	3	10. 40. 47,36	+ 3,160
$\sigma$ Piscium.....	2	1. 36. 54,00	+ 3,148	* ( <i>z</i> ) N.P.D. 26°. 12'	4	10. 44. 38,18	+ 3,945
$\epsilon$ Cassiopeiæ.....	1	1. 42. 53,31	+ 4,191	* N.P.D. 26°. 1'....	2	10. 52. 23,54	+ 3,864
$\gamma^1$ Arietis.....	1	1. 44. 42,36	+ 3,264	$\chi$ Leonis.....	4	10. 56. 42,61	+ 3,086
$\beta$ Arietis.....	2	1. 45. 45,54	+ 3,283	* N.P.D. 26°. 38'...	3	11. 16. 47,76	+ 3,567
$\alpha$ ARIETIS.....	21	1. 58. 6,72	+ 3,346	$\tau$ Leonis.....	2	11. 19. 39,55	+ 3,084
$\theta^1$ Arietis.....	1	2. 9. 10,80	+ 3,315	$\nu$ Leonis.....	1	11. 28. 42,41	+ 3,068
A.S.C. 268.....	1	2. 27. 15,76	+ 3,153	$\beta$ LEONIS.....	43	11. 40. 50,62	+ 3,066
$\nu$ Arietis.....	1	2. 29. 41,25	+ 3,382	$\beta$ Virginis.....	2	11. 42. 18,66	+ 3,124
A.S.C. 279.....	1	2. 31. 46,92	+ 3,145	$\sigma$ Virginis.....	1	11. 57. 0,60	+ 3,071
$\pi$ Arietis.....	1	2. 40. 18,98	+ 3,326	$\eta$ Virginis.....	2	12. 11. 40,43	+ 3,068
$\epsilon$ Arietis.....	2	2. 50. 1,15	+ 3,408	$q$ Virginis.....	1	12. 25. 28,53	+ 3,090
$\alpha$ CETI.....	14	2. 53. 52,32	+ 3,126	$\kappa$ Draconis.....	4	12. 26. 34,24	+ 2,600
$\delta$ Arietis.....	1	3. 2. 26,13	+ 3,398	$\gamma^1$ Virginis.....	2	12. 33. 30,59	+ 3,022
14 Eridani.....	1	3. 8. 47,86	+ 2,899	42 Virginis (?).....	1	12. 47. 7,13	+ 3,027
$\eta$ Tauri.....	2	3. 37. 55,56	+ 3,542	$g$ Virginis.....	1	12. 59. 27,99	+ 3,127
A <sup>1</sup> Tauri.....	4	3. 55. 11,24	+ 3,520	SPICA.....	25	13. 16. 43,29	+ 3,150
$\nu^1$ Tauri.....	3	4. 16. 41,02	+ 3,564	78 Virginis... ..	4	13. 25. 58,64	+ 3,029
ALDEBARAN.....	31	4. 26. 41,40	+ 3,427	$\sigma$ Virginis.....	4	13. 34. 58,48	+ 3,027
$\tau$ Tauri.....	1	4. 32. 35,18	+ 3,584	$\alpha$ Virginis.....	2	13. 41. 8,17	+ 3,245
$\iota$ Tauri.....	1	4. 53. 28,53	+ 3,568	ARCTURUS.....	35	14. 8. 19,25	+ 2,733
RIGEL.....	34	5. 6. 48,26	+ 2,878	$\lambda$ Virginis.....	2	14. 10. 24,50	+ 3,228
$\beta$ TAURI.....	33	5. 16. 7,15	+ 3,782	$\iota$ Bootis.....	3	14. 11. 28,83	+ 2,891
$\iota$ Aurigæ.....	1	5. 28. 18,22	+ 3,844	10 Hydræ Con.....	4	14. 36. 41,95	+ 3,455
C Tauri.....	2	5. 43. 12,53	+ 3,763	$\epsilon$ BOOTIS.....	11	14. 37. 57,36	+ 2,623
$\alpha$ ORIONIS.....	12	5. 46. 27,46	+ 3,243	11 Hydræ Con.....	3	14. 38. 1,75	+ 3,462
$\kappa$ Aurigæ.....	2	6. 5. 7,07	+ 3,825	A.S.C. 1673.....	3	14. 38. 5,46	+ 3,387
$\epsilon$ Geminorum.....	3	6. 34. 1,38	+ 3,693	$\alpha^2$ LIBRÆ.....	18	14. 41. 59,01	+ 3,309
$\tau$ Geminorum.....	1	7. 0. 53,00	+ 3,829	20 Libræ.....	2	14. 54. 39,74	+ 3,490
$\delta$ Geminorum.....	1	7. 10. 29,99	+ 3,590	* N.P.D. 97°. 16'...	1	15. 6. 49,57	+ 3,191
$\iota$ Geminorum.....	4	7. 15. 43,20	+ 3,744	* N.P.D. 97°. 16'...	6	15. 8. 37,55	+ 3,193
CASTOR.....	46	7. 24. 19,04	+ 3,857	* N.P.D. 106°. 53'..	7	15. 20. 29,04	+ 3,379
PROCYON.....	55	7. 30. 52,21	+ 3,145	$\alpha$ CORONÆ BOREALIS	13	15. 27. 52,41	+ 2,528
POLLUX.....	55	7. 35. 27,29	+ 3,684	$\tau^2$ Serpentis.....	4	15. 29. 4,39	+ 2,752
6 Cancri.....	1	7. 53. 37,05	+ 3,701	$\phi$ Libræ.....	1	15. 29. 39,11	+ 3,427
$\lambda$ Cancri.....	2	8. 10. 57,08	+ 3,582	$\chi$ Libræ.....	3	15. 30. 46,69	+ 3,524
$\theta$ Cancri.....	1	8. 22. 24,62	+ 3,436	$\theta$ Ursæ Minoris.....	4	15. 36. 19,63	- 1,990
$\gamma$ Cancri.....	2	8. 33. 57,68	+ 3,493	$\alpha$ SERPENTIS.....	6	15. 36. 20,58	+ 2,939
$\delta$ Cancri.....	2	8. 35. 31,68	+ 3,422	$b$ Scorpii.....	2	15. 41. 18,52	+ 3,585
* ( <i>a</i> ) N.P.D. 68°. 2'	3	8. 48. 9,48	+ 3,468	$\delta$ Scorpii.....	2	15. 50. 49,46	+ 3,527
* ( <i>d</i> ) N.P.D. 68°. 21'	1	8. 58. 30,58	+ 3,446	$\theta$ Draconis.....	3	15. 58. 52,85	+ 1,147
$\xi$ Cancri.....	5	9. 0. 5,57	+ 3,465	A.S.C. 1848.....	2	16. 1. 2,82	+ 3,709
* ( <i>e</i> ) N.P.D. 68°. 40'	1	9. 3. 32,03	+ 3,431	16 Scorpii.....	2	16. 3. 24,35	+ 3,234
* ( <i>g</i> ) N.P.D. 68°. 31'	2	9. 9. 26,58	+ 3,425	48 Serpentis.....	2	16. 4. 11,56	+ 2,708
$q$ Cancri.....	2	9. 9. 59,22	+ 3,369	F Herculis.....	1	16. 4. 46,98	+ 2,549
* ( <i>h</i> ) N.P.D. 68°. 47'	1	9. 10. 30,51	+ 3,418	$\delta$ OPHIUCHI.....	23	16. 5. 54,98	+ 3,138
* N.P.D. 68°. 57'...	4	9. 14. 41,70	+ 3,408	$\sigma$ Scorpii.....	1	16. 11. 24,86	+ 3,626
* ( <i>k</i> ) N.P.D. 70°. 15'	1	9. 17. 31,59	+ 3,380	ANTARES.....	29	16. 19. 32,88	+ 3,663

CATALOGUE OF THE CONCLUDED MEAN RIGHT ASCENSIONS, &c. *continued.*

Name of Star.	Number of Obser- vations.	Mean R.A. Jan. 1, 1839.	Annual Variation.	Name of Star.	Number of Obser- vations.	Mean R.A. Jan. 1, 1839.	Annual Variation.
		<i>h. m. s.</i>	<i>s.</i>			<i>h. m. s.</i>	<i>s.</i>
<i>n</i> Herculis.....	3	16.24.40,63	+ 2,942	$\beta$ AQUILÆ.....	46	19.47.24,33	+ 2,945
$\tau$ Scorpii.....	1	16.25.52,29	+ 3,715	<i>c</i> Sagittarii.....	4	19.52.45,05	+ 3,700
* N.P.D. 80°.11'....	4	16.30.15,66	+ 2,855	$\alpha^2$ CAPRICORNI.....	36	20.9.7,08	+ 3,332
<i>i</i> Herculis.....	3	16.38.6,39	+ 2,872	$\sigma$ Capricorni.....	3	20.10.5,88	+ 3,471
<i>i</i> Ophiuchi.....	3	16.46.23,69	+ 2,834	$\pi$ Capricorni.....	1	20.18.6,00	+ 3,443
A.S.C. 1949.....	2	16.55.13,46	+ 3,541	* N.P.D. 26°.38'...	5	20.24.8,88	+ 0,914
* N.P.D. 76°.10'....	4	16.56.15,55	+ 2,752	$\psi$ Capricorni.....	2	20.36.33,26	+ 3,572
29 Scorpii.....	2	17.4.13,00	+ 3,722	$\eta$ Capricorni.....	2	20.55.14,25	+ 3,430
A Ophiuchi.....	2	17.5.27,64	+ 3,671	* N.P.D. 60°.26'....	2	21.1.6,55	+ 2,535
$\alpha$ HERCULIS.....	34	17.7.18,51	+ 2,732	* N.P.D. 60°.26'....	3	21.1.49,34	+ 2,536
$\theta$ Ophiuchi.....	2	17.12.7,76	+ 3,672	* N.P.D. 25°.0'.....	5	21.2.22,04	+ 1,063
* N.P.D. 61°.0'....	2	17.12.30,05	+ 2,343	* N.P.D. 25°.2'.....	1	21.2.39,16	+ 1,069
$\rho$ Herculis.....	2	17.18.8,00	+ 2,067	<i>s</i> Capricorni.....	2	21.6.49,88	+ 3,329
* N.P.D. 57°.11'....	6	17.18.41,00	+ 2,220	* N.P.D. 76°.45'....	1	21.8.57,29	+ 2,854
* N.P.D. 55°.3'.....	3	17.26.7,25	+ 2,145	* N.P.D. 76°.43'....	3	21.9.14,79	+ 2,854
$\alpha$ OPHIUCHI.....	49	17.27.27,81	+ 2,773	* N.P.D. 75°.23'....	6	21.20.3,38	+ 2,844
<i>p</i> Sagittarii.....	2	17.37.25,83	+ 3,768	$\beta$ AQUARIÆ.....	22	21.23.4,82	+ 3,163
* N.P.D. 48°.12'....	5	17.46.7,89	+ 1,878	$\gamma$ Capricorni.....	1	21.31.9,81	+ 3,322
* N.P.D. 48°.16'....	1	17.46.30,67	+ 1,875	$\delta$ Capricorni.....	3	21.38.8,97	+ 3,304
$\theta$ Herculis.....	5	17.50.44,03	+ 2,052	$\alpha$ AQUARIÆ.....	19	21.57.30,88	+ 3,083
$\gamma$ Draconis.....	3	17.52.52,27	+ 1,388	<i>i</i> Aquarii.....	1	21.57.44,24	+ 3,247
9 Sagittarii.....	4	17.54.0,34	+ 3,673	$\theta$ Aquarii.....	2	22.8.20,00	+ 3,163
$\gamma^2$ Sagittarii.....	1	17.55.28,09	+ 3,852	$\sigma$ Aquarii.....	1	22.22.7,36	+ 3,182
* N.P.D. 44°.18'....	6	18.0.30,05	+ 1,699	* N.P.D. 24°.20'....	7	22.35.24,11	+ 2,002
$\delta$ Sagittarii.....	2	18.10.41,38	+ 3,835	$\iota$ Cephei.....	4	22.43.58,02	+ 2,118
$\lambda$ Sagittarii.....	1	18.18.2,07	+ 3,704	$\lambda$ Aquarii.....	4	22.44.12,76	+ 3,133
$\delta$ URSE MINORIS....	52	18.24.14,56	- 19,221	$\alpha$ PEGASÆ.....	23	22.56.44,78	+ 2,977
A.S.C. 2151.....	2	18.28.30,53	+ 3,483	$\phi$ Aquarii.....	4	23.5.59,02	+ 3,106
* N.P.D. 38°.21'....	1	18.30.46,80	+ 1,394	$\kappa^1$ Piscium.....	3	23.18.40,88	+ 3,067
$\sigma$ Sagittarii.....	2	18.45.16,88	+ 3,722	<i>s</i> Cephei.....	4	23.20.30,55	+ 2,452
* N.P.D. 87°.44'...	3	18.48.19,58	+ 3,016	$\gamma$ Cephei.....	4	23.32.47,71	+ 2,390
64 Serpentis.....	2	18.49.10,95	+ 3,015	$\lambda$ Piscium.....	3	23.33.49,94	+ 3,066
$\tau$ Sagittarii.....	2	18.56.53,20	+ 3,755	$\omega$ Piscium.....	3	23.51.2,91	+ 3,062
A.S.C. 2212.....	1	18.57.22,44	+ 3,783	<i>q</i> Piscium.....	2	23.53.34,55	+ 3,071
O Sagittarii.....	1	19.16.45,60	+ 3,799	* N.P.D. 25°.26'....	4	23.53.39,18	+ 2,990
$h^2$ Sagittarii.....	2	19.26.54,33	+ 3,654	* N.P.D. 26°.22'....	2	23.54.16,25	+ 3,001
$\alpha$ AQUILÆ.....	70	19.42.55,70	+ 2,926	* N.P.D. 26°.42'....	3	23.58.7,48	+ 3,047
59 Sagittarii.....	1	19.47.3,59	+ 3,693				





**ZENITH DISTANCES**  
**OBSERVED WITH THE MURAL CIRCLE,**  
**AND**  
**CALCULATION**  
**OF**  
**GEOCENTRIC NORTH POLAR DISTANCES.**

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**1839.**



Month and Day.	NAME OF STAR or PLANET.	Pointer.  " "	Microscopes.						Micrometer, or Time by Molyneux.  h. m. s.	Correction for Microm. or Time.  " "	Concluded reading of Circle.  " "	Observer.
			A	B	C	D	E	F				
			" "	" "	" "	" "	" "	" "				
Jan. 7	(a) α Lyrae R. M.....	209.50	2.27,6	30,6	26,5	29,4	29,6	26,5	9,643	+10,15 -0,12	209.52.38,51	C.
	(b) α Lyrae.....	57.0	1.45,4	47,7	44,7	44,3	48,6	43,3		+0,61	57.1.46,36	C.
Jan. 8	(c) ☉ S.L. M.....	118.5	4.59,5	64,4	60,2	64,5	62,3	60,7	6,930	+1.6,63	118.11.8,56	G.
	☉ N.L. M.....	117.35	2.32,5	37,7	31,8	37,7	35,3	35,3	6,930	+1.6,63	117.38.41,80	C.
	(d) Venus N.L.....	118.10	0.10,7	15,7	11,6	16,1	13,4	12,7			118.10.13,38	C.
	(e) α Persei R. M.....	220.30	1.21,7	24,5	21,3	25,8	22,9	23,6	9,361	+16,03 -0,17	220.31.39,23	C.
	(f) α Persei.....	46.20	2.45,6	48,0	46,5	46,1	48,2	44,2		+1,08	46.22.47,65	C.
	α Lyrae R. M.....	209.50	3.24,8	31,0	24,0	30,0	28,2	24,4	12,420	-47,97	209.52.39,26	G.
	α Lyrae.....	57.0	1.46,0	48,2	46,3	46,1	48,2	44,0			57.1.46,55	G.
Jan. 9	☉ N.L. M.....	117.30	2.22,2	28,5	22,4	22,8	25,4	21,8	15,678	-1.55,98	117.30.27,99	G.
	☉ S.L.....	118.0	2.55,3	62,4	56,2	55,8	57,8	54,2			118.2.57,08	G.
	Vesta.....	72.55	0.32,1	37,8	34,0	33,6	34,9	33,0			72.55.34,27	G.
	α Lyrae R. M.....	209.50	3.19,2	26,5	20,8	24,0	24,0	21,0	12,210	-43,59	209.52.39,14	G.
	α Lyrae.....	57.0	1.44,0	49,6	45,0	45,0	47,4	43,8			57.1.45,88	G.
Jan. 10	☉ S.L. M.....	117.55	0.19,3	26,2	22,9	26,5	26,0	24,9	13,261	-1.5,53	117.54.18,79	G.
	☉ N.L.....	117.20	1.50,2	56,6	51,9	55,5	54,8	50,9			117.21.53,40	G.
	Venus N.L.....	117.45	2.15,8	23,0	18,2	22,2	21,2	17,4			117.47.19,73	G.
Jan. 12	(g) ☉ S.L. M.....	117.35	1.34,8	42,8	34,8	42,0	40,8	36,5	12,131	-41,94	117.35.56,74	G.
	☉ N.L.....	117.0	3.26,3	30,6	27,0	32,0	32,8	25,6			117.3.29,22	G.
	(h) α Cassiopeiae R. M.	226.50	3.17,7	23,8	18,2	22,5	26,0	19,8	8,958	+24,44 -0,22	226.53.45,70	G.
	α Cassiopeiae.....	40.0	0.34,5	38,0	34,8	37,3	40,1	36,0		+0,88	40.0.37,70	G.
Jan. 14	ζ Ursae Min. SP. } R. M.....	272.55	2.12,7	17,9	15,6	18,0	20,5	15,3	12,668	-53,15	272.56.23,62	G.
	ζ Ursae Minoris SP. η Draconis SP. R. } M.....	353.55	2.53,4	58,9	55,8	57,0	63,4	54,5			353.57.57,30	G.
	η Draconis SP.....	289.20	1.22,4	27,0	23,4	28,3	29,2	26,2	15,025	-1.42,34	289.19.43,81	G.
		337.30	4.36,2	40,0	37,9	39,2	45,8	37,0			337.34.29,57	G.
Jan. 15	☉ N.L. M.....	116.30	3.22,8	28,9	23,2	28,3	26,7	22,5	12,199	-43,36	116.32.42,16	G.
	☉ S.L.....	117.5	0.5,8	13,2	7,9	13,0	9,7	8,0			117.5.9,60	G.
	Capella R. M.....	217.0	4.14,8	23,2	17,0	19,0	21,0	15,5	10,222	-2,09	217.4.16,48	G.
	Capella.....	49.45	5.5,0	11,8	7,8	8,0	11,0	3,8			49.50.8,07	G.
	β Tauri R. M.....	199.40	1.21,7	29,8	24,7	28,4	27,5	27,0	6,100	+1.23,95	199.42.50,52	G.
	β Tauri.....	67.10	1.30,8	37,2	32,0	32,9	35,1	32,9			67.11.33,53	G.
	δ Orionis R. M.....	170.45	3.16,8	26,2	20,9	21,8	22,7	20,0	4,550	+1.56,31	170.50.17,83	G.
	δ Orionis.....	96.0	4.4,8	12,0	7,0	9,0	9,3	5,0			96.4.7,98	G.
	Vesta.....	72.35	0.56,0	61,5	60,4	60,5	60,0	57,8			72.35.59,40	G.
	Mercury, center...	116.15	3.18,3	25,8	19,9	22,6	23,4	19,0			116.18.21,62	G.
	(i) α Lyrae R. M.....	209.50	3.27,0	33,9	28,3	32,4	32,1	27,6	12,698	-53,78	209.52.36,55	G.
	α Lyrae.....	57.0	1.46,3	50,5	47,6	47,5	51,4	47,0			57.1.48,45	G.
Jan. 16	☉ S.L. M.....	116.50	3.15,4	27,0	17,5	20,7	20,1	14,8	8,051	+43,23	116.54.2,60	G.
	☉ N.L. M.....	116.20	0.49,0	57,9	51,6	54,5	52,8	51,5	8,051	+43,23	116.21.36,15	G.
	Venus N.L.....	116.20	2.58,2	69,4	61,0	63,5	63,9	58,3			116.23.2,48	G.
	α Cassiopeiae R. M.	226.50	3.13,4	23,8	14,8	18,8	16,7	16,0	8,733	+28,99	226.53.46,36	G.
	α Cassiopeiae.....	40.0	0.37,0	45,1	38,3	39,6	42,0	38,5			40.0.40,10	G.
Jan. 17	☉ N.L. M.....	116.10	0.42,0	51,8	44,4	48,3	46,1	44,0	12,221	-43,82	116.10.2,30	G.
	☉ S.L.....	116.40	2.25,1	34,9	27,2	29,3	29,0	26,0			116.42.28,67	G.
	(k) Capella R.....	217.0	4.14,1	24,5	15,8	16,8	16,0	14,0			217.4.17,02	G.
	(l) Capella.....	49.45	5.2,8	15,1	6,5	5,6	10,1	1,3		+0,62	49.50.7,69	G.
	δ Orionis R. M.....	170.45	4.16,0	28,0	19,9	21,2	22,0	18,0	7,330	+58,28	170.50.19,28	G.
	δ Orionis.....	96.0	4.2,7	12,8	7,0	6,8	8,0	2,0			96.4.6,68	G.

Runs taken Jan. 8, 1<sup>h</sup>, and Jan. 24, 1<sup>h</sup>. (Temp. 41°.) Coincidences Jan. 24, 1<sup>h</sup>.

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|--|---|
| (a) At 4th wire; too much wind. Before this observation the Circle was taken from the wall, the axis was cleaned and microscopes adjusted; It is believed that at the same time the focal lengths of some of the microscopes were altered, but no memorandum was made. | (d) Very badly defined.                                     |
| (b) At $2\frac{1}{2}$ intervals past middle wire.  | (e) At 4th wire; unsatisfactory.                            |
| (c) Much waving of the limbs. No correction for runs: the N.L. also was taken on micrometer-wire.  | (f) At $2\frac{1}{2}$ intervals past middle wire.           |
|  | (g) Waving limbs: microscope damp and divisions indistinct. |
|  | (h) At 4th and 5th wires.                                   |
|  | (i) Very good.  |
|  | (k) Came on the fixed wire.                                 |
|  | (l) At 5th wire.  |

Sec. of apparent Zenith. Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
12,43	13.34.33,84	29,436	36,4	36,4	14,26				51.21.56,38	$\alpha$ Lyræ R.
	13.34.34,01								51.21.56,55	$\alpha$ Lyræ.
13,44	74.43.56,21	29,432	36,6	36,6	3.32,93	8,39		16.17,10	112.18.11,93	$\odot$ .
	74.11.29,45				3.25,49	8,37			112.18.11,95	$\odot$ .
12,91	74.43.1,03		36,8	37,3	3.32,38	4,85	9,627	5,17	112.33.42,01	Venus.
	2.55.33,12	29,460	36,3	34,5	3,03				40.42.44,43	$\alpha$ Persei R.
12,91	2.55.35,30								40.42.46,61	$\alpha$ Persei.
	13.34.33,09	29,692	33,8	32,9	14,49				51.21.55,86	$\alpha$ Lyræ R.
12,51	13.34.34,20								51.21.56,97	$\alpha$ Lyræ.
	74.3.15,64	29,708	33,8	33,0	3.27,17	8,36		16.17,10	112.9.59,83	$\odot$ .
12,51	74.35.44,73				3.34,62	8,39			112.10.2,14	$\odot$ .
	29.28.21,92	30,050	28,6	26,8	34,74	2,66			67.16.2,28	Vesta.
11,70	13.34.33,21	30,160	35,8	35,8	14,62				51.21.56,11	$\alpha$ Lyræ R.
	13.34.33,53								51.21.56,43	$\alpha$ Lyræ.
11,70	74.27.6,44	30,144	37,2	37,4	3.33,68	8,38		16.17,00	112.1.23,02	$\odot$ .
	73.54.41,05				3.26,33	8,36			112.1.24,30	$\odot$ .
11,70	74.20.7,38	30,136	37,8	38,6	3.31,46	4,84	9,712	4,28	112.10.46,56	Venus.
	74.8.44,39	30,122	43,6	46,0	3.25,54	8,37		16.16,90	111.42.52,94	$\odot$ .
11,70	73.36.16,87				3.18,58	8,35			111.42.52,28	$\odot$ .
	-3.26.33,35	30,144	42,2	41,0	3,60				34.20.31,33	$\alpha$ Cassiopeiæ R.
10,46	-3.26.34,65								34.20.30,03	$\alpha$ Cassiopeiæ.
	-49.29.11,27	29,608	41,2	40,8	1.8,75				-11.43.11,74	$\zeta$ Ur. Min. SP. R.
11,69	-49.29.15,05								-11.43.15,52	$\zeta$ Ursæ Min. SP.
	-65.52.31,46				2.10,62				-28.7.33,80	$\eta$ Dracon. SP. R.
12,28	-65.52.32,78								-28.7.35,12	$\eta$ Draconis SP.
	73.5.29,81	29,646	40,6	40,4	3.11,59	8,32		16.16,70	111.11.58,06	$\odot$ .
12,03	73.37.57,25				3.18,13	8,34			111.11.58,62	$\odot$ .
	6.22.55,87	29,826	36,6	35,7	6,70				44.10.10,85	Capella R.
12,91	6.22.55,72								44.10.10,70	Capella.
	23.44.21,83				26,34				61.31.56,45	$\beta$ Tauri R.
12,50	23.44.21,18				1.18,24				61.31.55,80	$\beta$ Tauri.
	52.36.54,52								90.25.21,04	$\delta$ Orionis R.
12,50	52.36.55,63								90.25.22,15	$\delta$ Orionis.
	29.8.47,05	29,846	36,5	35,0	33,47	2,60			66.56.26,20	Vesta.
12,50	72.51.9,27	29,830	37,0	35,2	3.12,10	9,99			110.41.19,66	Mercury.
	13.34.35,80				14,48				51.21.58,56	$\alpha$ Lyræ R.
13,23	13.34.36,10								51.21.58,86	$\alpha$ Lyræ.
	73.26.50,25	29,820	37,5	37,4	3.18,25	8,34		16.16,60	111.0.51,84	$\odot$ .
12,36	72.54.23,80				3.11,75	8,31			111.0.52,12	$\odot$ .
	72.55.50,13		37,8	37,6	3.11,96	4,83	9,678	4,63	110.46.10,17	Venus.
12,98	-3.26.34,01	29,810	35,2	34,2	3,61				34.20.30,66	$\alpha$ Cassiopeiæ R.
	-3.26.32,25								34.20.32,42	$\alpha$ Cassiopeiæ.
12,36	72.42.49,95	29,922	35,8	35,0	3.11,13	8,30		16.16,60	110.49.17,66	$\odot$ .
	73.15.16,32				3.17,56	8,33			110.49.17,23	$\odot$ .
12,98	6.22.55,33	29,994	31,8	30,5	6,81				44.10.10,42	Capella R.
	6.22.55,34								44.10.10,43	Capella.
12,98	52.36.53,07				1.19,55				90.25.20,90	$\delta$ Orionis R.
	52.36.54,33								90.25.22,16	$\delta$ Orionis.

Coincidence of Micrometer Wire with fixed Wire = 10',112, 10',118, 10',122, 10',129, 10',134 at the five wires.

One Micrometer Revolution = 20",873.

Correction for Runs = +1",4. From Jan. 15 = +1",0.

Adopted Zenith Point = 43°.27'.12",35.

Assumed Co-latitude = 37°.47'.8",28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.	Microscopes.						Micrometer, or Time by Molyneux.	Correction for Microm. or Time.	Concluded reading of Circle.	Observer.
			A	B	C	D	E	F				
			° ' "	° ' "	° ' "	° ' "	° ' "	° ' "				
Jan. 17	(a) $\epsilon$ Orionis R. M....	169.50	4. 6,0	17,0	10,3	12,1	11,2	8,3	1,559	+2.58,73	169.57. 9,68	G.
	$\epsilon$ Orionis.....	96.55	2. 10,3	22,0	15,4	16,1	15,3	15,1			96.57. 15,78	G.
Jan. 18	$\odot$ S.L. M.....	116.30	1.29,5	38,3	31,7	36,2	35,5	33,1	12,962	-59,28	116.30.34,82	G.
	$\odot$ N.L.....	115.55	3. 4,2	13,0	7,7	10,9	10,1	4,9			115.58. 8,57	G.
Jan. 19	Capella R. M. ....	217. 0	4.16,2	27,0	19,0	21,2	22,7	18,0	10,352	-4,80	217. 4.16,03	G.
	Capella.....	49.45	5. 1,8	11,2	5,8	5,5	12,4	1,5			49.50. 6,53	G.
	$\beta$ Tauri R. M....	199.40	1.27,3	38,6	31,0	34,0	37,2	33,0	6,490	+1.15,81	199.42.49,38	G.
	$\beta$ Tauri.....	67.10	1.28,2	36,6	31,0	32,1	36,0	31,7			67.11.32,65	G.
	$\delta$ Orionis R. M....	170.45	4.11,2	22,0	16,1	17,8	20,3	13,0	7,277	+59,38	170.50.16,26	G.
	$\delta$ Orionis.....	96. 0	4. 3,2	13,0	7,8	8,9	11,4	4,0			96. 4. 8,18	G.
	(b) Vesta.....	72.20	3.41,0	49,0	44,4	42,4	49,0	40,5	12,893	-57,84	72.23.44,52	G.
	$\delta$ U. Min. SP. R.M.	264.35	4.10,8	20,2	13,2	15,9	17,5	12,6			264.38.17,33	G.
	$\delta$ Ursæ Minoris SP.	2.15	1. 2,3	10,8	7,1	8,4	11,7	6,5			2.16. 7,83	G.
Jan. 21	(c) Mercury, center...	117. 5	3.43,2	52,9	47,4	48,7	49,7	44,8			117. 8.47,92	G.
Jan. 22	$\odot$ S.L. M.....	115.35	3.15,9	25,9	18,3	22,9	22,3	17,8	7,690	+50,77	115.39.11,40	G.
	$\odot$ N.L.....	115. 5	1.42,0	49,0	45,0	48,0	46,7	45,0			115. 6.46,02	G.
	(d) $\alpha$ Arietis R. M....	193.55	1.44,2	54,8	48,4	50,8	50,8	48,8	9,760	+7,55	193.56.57,25	G.
	$\alpha$ Arietis.....	72.55	2.22,6	30,7	26,1	26,1	28,7	24,5			72.57.26,53	G.
	(e) $\delta$ S.L.....	79.55	4.15,0	22,2	18,4	18,1	19,3	13,8	10,318	-8,30	79.59. 9,65	G.
	$\delta$ S.L. M.....	79.55	4.15,0	22,2	18,4	18,1	19,3	13,8			79.59. 9,63	G.
	$\delta$ S.L. M.....	79.55	4.15,0	22,2	18,4	18,1	19,3	13,8	10,528	-4,15	79.59. 9,47	G.
	$\delta$ S.L. M.....	79.55	4.15,0	22,2	18,4	18,1	19,3	13,8			79.59. 9,45	G.
	$\delta$ S.L. M.....	79.55	4.15,0	22,2	18,4	18,1	19,3	13,8	10,740	-8,48	79.59. 9,47	G.
	$\delta$ S.L. M.....	79.55	4.15,0	22,2	18,4	18,1	19,3	13,8			79.59. 9,35	G.
	$\delta$ S.L. M.....	79.55	4.15,0	22,2	18,4	18,1	19,3	13,8	10,939	-12,75	79.59. 9,35	G.
	$\delta$ S.L. M.....	79.55	4.15,0	22,2	18,4	18,1	19,3	13,8			79.59. 9,45	G.
	$\pi$ Arietis.....	78.50	1.42,7	48,9	47,0	45,9	47,2	43,8	7,234	+1. 0,29	78.51.45,98	G.
	$\epsilon$ Arietis M.....	74.55	1.40,5	48,4	43,4	46,9	45,9	44,5			74.57.45,27	G.
	$\alpha$ Ceti R. M.....	174.40	1.39,0	48,0	41,6	46,0	43,7	43,0	6,988	+1. 5,42	174.42.49,02	G.
	$\alpha$ Ceti.....	92.10	1.33,4	40,1	35,0	38,0	37,6	35,3			92.11.36,62	G.
	Vesta.....	72.10	4.55,3	62,4	59,2	56,0	59,9	52,8			72.14.57,77	G.
Jan. 24	$\odot$ S.L. M.....	115. 5	4.28,8	37,0	32,1	36,9	37,0	30,7	5,130	+1.44,20	115.11.18,10	G.
	$\odot$ N.L.....	114.35	3.46,6	56,4	50,3	53,1	53,9	47,9			114.38.51,50	G.
	$\alpha$ Cygni R. M....	215.55	1.24,0	30,0	25,9	30,9	31,1	28,9	9,098	+21,37	215.56.49,89	G.
	(f) $\alpha$ Cygni.....	50.55	2.31,1	35,4	33,1	33,2	38,1	31,0			50.57.33,88	G.
	Venus S.L.....	113.55	1.43,0	51,8	46,0	52,1	51,0	46,0	9,790	+0,15	113.56.48,38	G.
	$\alpha$ Cephei R. M....	233. 5	3.17,3	22,9	18,0	22,8	23,5	19,0			233. 8.27,63	G.
	$\alpha$ Cephei.....	33.45	0.53,0	58,2	56,9	57,5	60,0	54,9	9,464	+6,93	33.45.56,78	G.
	$\beta$ U. Min. SP. R.M.	276.20	4.21,7	29,7	22,9	24,9	28,9	22,4			276.24.38,96	G.
	$\beta$ Ursæ Min. SP..	350.25	4.38,2	45,5	41,2	42,9	46,7	38,1	10,266	+13,73	350.29.42,25	G.
	(g) $\delta$ S.L.....	70.35	1. 2,5	9,0	5,0	5,9	8,2	3,5			70.36. 8,10	G.
	$\delta$ S.L. M.....	70.35	1. 2,5	9,0	5,0	5,9	8,2	3,5			70.36. 7,72	G.
Jan. 28	Mercury, center..	117.45	0. 9,7	15,5	12,8	16,8	15,0	13,2			117.45.13,83	G.
Jan. 29	(h) $\odot$ N.L. M.....	113.20	3.15,2	20,0	16,9	19,4	20,8	16,4	10,639	-10,80	113.23. 7,43	G.
	$\odot$ S.L.....	113.55	0.25,0	31,6	28,5	31,8	31,5	29,4			113.55.29,65	G.
	(i) $\delta$ N.L.....	75.55	0.45,6	48,7	49,3	49,4	50,5	48,1	9,910	+6,86	75.55.55,49	C.
	$\delta$ N.L. M.....	75.55	0.45,6	48,7	49,3	49,4	50,5	48,1			75.55.56,40	C.
	(k) Mercury, center..	117.45	1.51,0	58,6	55,9	57,0	57,2	53,8			117.46.55,65	G.
Jan. 30	(l) $\odot$ S.L. M.....	113.35	3.23,8	32,1	28,2	30,5	30,9	27,9	7,608	+52,48	113.39.21,50	G.
	(l) $\odot$ N.L.....	113. 5	1.54,1	62,0	59,0	60,4	59,9	56,8			113. 6.58,77	G.
	Venus N.L.....	111.40	4.41,0	49,0	44,9	46,0	48,2	41,4			111.44.54,25	G.

(a) The mercury much disturbed by wind. (b) The attached thermometer was read 46° 5, but was doubtless 10° in error. (c) Very faint. (d) The micrometer was read 10°, 760. (e) At the five wires; well defined and steady. (f) At the 4th wire. (g) At the 4th and 5th wires. (h) Very faint and indistinct. (i) At 1st and 2nd wires; extremely doubtful, the lamp-support of microscope E happening to be just over the object-glass. (k) Very indistinct. (l) Without dark glass.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	" / "	Inch.	"	"	" "	" "	"	" "	" / "	"
12,73	53.30.267	29,994	31,8	30,5	1.22,14				91.18.33,09	ε Orionis R.
	53.30.343								91.18.33,85	ε Orionis.
	73.3.22,47	30,050	34,0	35,5	3.15,79	8,32		16.16,50	110.37.21,72	☉.
	72.30.56,22								110.37.22,22	☉.
11,28	6.22.56,32	29,716	37,3	36,4	6,67				44.10.11,27	Capella R.
	6.22.54,18								44.10.9,13	Capella.
11,02	23.44.22,97				26,20				61.31.57,45	β Tauri R.
	23.44.20,30								61.31.54,78	β Tauri.
12,22	52.36.56,09				1.17,84				90.25.22,21	δ Orionis R.
	52.36.55,83								90.25.21,95	δ Orionis.
12,58	28.56.32,17	29,726	36,5	35,2	33,04	2,55			66.44.10,94	Vesta.
	-41.11.4,98								-3.24.48,94	δ U. Min. SP. R.
	-41.11.4,52				52,24				-3.24.48,48	δ Ursæ Min. SP.
11,89	73.41.35,57	30,050	35,5	35,0	3.23,91	8,80			111.31.58,96	Mercury.
	72.11.59,05	30,090	36,7	36,0	3.6,05	8,27			109.45.49,01	☉.
	71.39.33,67				3.0,31	8,24		16.16,10	109.45.50,12	☉.
	29.30.15,10	30,216	36,0	34,6	34,41				67.17.57,79	α Arietis R.
	29.30.14,18								67.17.56,87	α Arietis.
	36.31.57,30								73.28.51,51	☽.
	36.31.57,28								73.28.51,49	☽.
	36.31.57,12				45,03	34.54,38		16.4,72	73.28.51,33	☽.
	36.31.57,00								73.28.51,21	☽.
	36.31.57,10								73.28.51,31	☽.
12,82	35.24.33,63	30,240			43,25				75.12.25,16	π Arietis.
	31.30.32,92				37,30				69.18.18,50	ε Arietis.
	48.44.23,33				1.9,28				86.32.40,89	α Ceti R.
	48.44.24,27								86.32.41,83	α Ceti.
	28.47.45,42	30,304	34,9	33,8	33,58	2,51			66.35.24,77	Vesta.
11,89	71.44.5,75	30,374	39,0	40,1	3.1,21	8,25			109.17.51,09	☉.
	71.11.39,15				2.55,74	8,22		16.15,90	109.17.50,85	☉.
	7.30.22,46				7,96				45.17.38,70	α Cygni R.
	7.30.21,53								45.17.37,77	α Cygni.
12,21	70.29.36,03	30,364	40,0	41,4	2.48,56	4,79	10,611	5,11	108.19.22,97	Venus.
	-9.41.15,28								28.5.42,71	α Cephei R.
10,61	-9.41.15,57				10,29				28.5.42,42	α Cephei.
	-52.57.26,61	30,320	41,3		1.19,57				-15.11.37,90	β U. Min. SP. R.
	-52.57.30,10								-15.11.41,39	β Ursæ Min. SP.
	27.8.55,75	30,300	41,7	41,0	30,85	26.24,13		15.53,83	64.14.16,92	☽.
	27.8.55,37								64.14.16,54	☽.
	74.18.1,48	29,436	34,7	33,7	3.28,26	7,81			112.8.30,21	Mercury.
	69.55.55,08	29,400	35,7	36,1	2.40,15	8,16			108.1.50,65	☉.
	70.28.17,30				2.44,86	8,18		16.15,30	108.1.46,96	☉.
	32.28.43,14	29,070	32,8	32,1					70.1.54,35	☽.
	32.28.44,05				37,43	29.48,50		15.14,00	70.1.55,26	☽.
	74.19.43,30	29,086	28,0	26,8	3.29,27	7,69			112.10.13,16	Mercury.
	70.12.9,15	29,046	30,3	30,0	2.42,63	8,17			107.45.36,69	☉.
	69.39.46,42				2.38,02	8,14		16.15,20	107.45.39,78	☉.
	68.17.32,90	29,020	31,0	30,4	2.27,02	4,74	9,633	5,11	106.7.8,57	Venus.

Coincidence of Micrometer Wire with fixed Wire = 10', 112, 10', 118, 10', 122, 10', 129, 10', 134 at the five wires.

One Micrometer Revolution = 20", 873.

Correction for Runs = + 1", 0.

Adopted Zenith Point = 43°. 27'. 12", 35.

Assumed Co-latitude = 37°. 47'. 8", 28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.	Microscopes.						Micrometer, or Time by Molyneux.	Correction for Microm. or Time.	Concluded reading of Circle.	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
Jan. 31	(a) ☉ N.L. M.....	112.50	1.18,0	26,4	24,0	24,3	24,9	20,9	12,813	- 56,17	112.50.26,96	G.
	☉ S.L.....	113.20	2.51,1	59,5	56,5	57,0	57,8	52,8			113.22.55,88	G.
Feb. 1	☉ N.L. M.....	112.30	3.36,0	48,9	41,7	45,3	43,7	40,0	10,388	- 5,55	112.33.37,17	G.
	☉ S.L.....	113.5	0.57,7	68,5	61,5	65,3	62,7	61,5			113.6.2,90	G.
Feb. 2	☉ S.L. M.....	112.45	3.20,0	31,5	23,5	27,5	24,7	23,4	8,597	+ 31,83	112.48.57,05	G.
	☉ N.L. ....	112.15	1.27,6	38,4	30,3	35,8	33,4	31,4			112.16.32,87	G.
	(b) Venus S.L.....	110.30	2.36,2	46,7	38,0	43,2	42,9	39,0			110.32.41,08	G.
Feb. 12	(c) Saturn S.L.....	115.40	0.45,3	51,5	48,8	52,4	52,4	49,0	9,325	- 0,22 + 16,76	115.40.49,76	G.
	α Cygni R. M.....	215.55	1.23,8	29,0	25,0	29,2	27,2	27,5			215.56.43,86	G.
	α Cygni.....	50.55	2.37,3	41,8	39,0	39,3	41,2	36,7			50.57.39,50	G.
Feb. 13	(d) ☉ N.L. M.....	108.50	1.23,0	30,4	27,1	29,9	27,1	26,4	12,763	- 55,00	108.50.32,47	G.
	☉ S.L.....	109.20	2.52,0	59,0	55,3	57,4	56,0	52,3			109.22.55,65	G.
Feb. 14	(e) ☉ S.L. M.....	109.0	2.18,4	24,2	20,9	23,9	22,8	19,9	8,937	+ 24,86	109.2.46,79	G.
	☉ N.L. ....	108.30	0.21,0	27,0	24,9	26,7	24,8	24,7			108.30.24,90	G.
	Capella R. M.....	217.0	4.18,2	25,8	18,4	20,8	20,8	17,3	10,278	- 3,13	217.4.17,55	G.
	Capella.....	49.45	4.61,3	68,5	63,1	63,8	66,2	58,9			49.50.4,18	G.
	Vesta.....	71.15	3.22,3	28,8	23,4	25,0	27,0	22,4	12,114	- 0,22 - 41,46 + 0,23	71.18.25,18	G.
	(f) Saturn S.L.....	115.40	1.38,0	45,8	39,3	43,0	40,4	40,2			115.41.41,08	G.
	α Cygni R. M.....	215.55	2.22,8	28,0	24,9	28,6	26,9	25,4			215.56.44,91	G.
	α Cygni.....	50.55	2.37,5	41,7	40,0	39,5	41,5	37,3			50.57.39,87	G.
	(g) Mercury, center...	115.35	1.1,7	7,9	5,2	7,9	4,9	2,9			115.36.5,43	G.
	☉ N.L. M.....	108.10	0.28,7	35,3	34,3	36,0	34,8	33,2	11,916	- 37,32	108.9.56,46	G.
	☉ S.L.....	108.40	2.14,8	21,2	18,3	21,0	18,9	16,1			108.42.18,63	G.
	Vesta.....	71.15	1.15,8	22,8	20,1	20,7	21,2	18,9			71.16.20,07	G.
Feb. 16	☉ S.L. M.....	108.20	1.19,0	24,0	21,4	24,8	22,2	21,2	9,068	+ 22,12	108.21.44,37	G.
	☉ N.L. ....	107.45	4.21,1	26,8	23,4	24,4	24,3	19,3			107.49.23,70	G.
	Venus S.L.....	104.10	3.6,9	13,0	9,7	13,9	11,4	6,4	10,310	- 3,80	104.13.10,57	G.
	Capella R. M.....	217.0	4.20,0	25,8	20,8	23,0	23,3	19,2			217.4.18,70	G.
	Capella.....	49.45	4.61,8	68,4	66,0	64,0	67,2	59,8			49.50.5,08	G.
	Vesta.....	71.10	4.13,1	17,8	17,5	15,3	18,8	12,0			71.14.16,22	G.
Feb. 18	Capella R. M.....	217.0	4.43,7	54,7	48,2	48,7	51,5	43,9	11,538	- 29,43	217.4.19,55	G.
	Capella.....	49.45	5.3,0	8,8	6,3	4,7	5,7	1,0			49.50.5,47	G.
	β Tauri R. M.....	199.40	2.17,5	25,2	22,0	22,8	22,0	21,0	8,708	+ 29,64	199.42.51,66	G.
	β Tauri.....	67.10	1.30,0	36,0	33,9	32,5	33,7	31,7			67.11.33,13	G.
	δ Orionis R. M...	170.45	4.18,8	26,2	23,9	24,2	24,8	20,5	7,702	+ 50,65	170.50.14,20	G.
	δ Orionis.....	96.0	4.5,5	11,1	9,8	9,0	9,2	4,9			96.4.8,70	G.
Feb. 19	Vesta.....	71.10	0.8,4	13,4	13,7	12,4	14,1	11,2	10,307 10,503 10,690 10,900	- 7,50 - 3,84 - 3,75 - 7,82 - 11,61 + 3,75 - 15,90 + 7,50	71.10.12,22	G.
	(h) ☉ S.L.....	75.55	4.18,0	22,0	23,2	20,2	21,2	15,8			75.59.13,03	G.
	☉ S.L. M.....	75.55	4.18,0	22,0	23,2	20,2	21,2	15,8			75.59.12,94	G.
	☉ S.L. M.....	75.55	4.18,0	22,0	23,2	20,2	21,2	15,8			75.59.12,71	G.
	☉ S.L. M.....	75.55	4.18,0	22,0	23,2	20,2	21,2	15,8			75.59.12,67	G.
	☉ S.L. M.....	75.55	4.18,0	22,0	23,2	20,2	21,2	15,8			75.59.12,13	G.
Feb. 20	Vesta.....	71.5	3.9,8	16,5	16,0	13,5	15,0	9,8	10,188	- 1,25	71.8.13,78	G.
	Vesta.....	71.5	1.13,0	17,0	17,0	15,1	17,9	15,0			71.6.15,97	G.
Feb. 21	(i) ☉ N.L. M.....	106.0	3.20,8	29,3	25,1	27,6	26,6	23,0	10,188	- 1,25	106.3.24,52	G.
	(k) Venus S.L.....	101.40	4.57,2	62,8	62,2	62,2	64,3	57,1			101.45.1,52	G.

Coincidences and Runs taken Feb. 25, 23<sup>h</sup>. (Temp. 39°).

(a) Very faint. (b) Faint. (c) At the 5th wire; Correction for change of N.P.D. insensible. More weights added to the counterpoise before this observation. The interval between the 2nd and 12th was uninterrupted cloudy. (d) Misty. (e) Cloudy. (f) At the 5th wire; no correction for change of N.P.D. (g) At the 5th wire; Correction for change of N.P.D. = + 0",45. (h) At the five wires. (i) Very cloudy and unsatisfactory. (k) Faint and doubtful.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N.P.D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	" / "	Inch.	"	"	" / "	" / "	"	" / "	" / "	"
11,68	69.23.14,61	29,020	32,3	32,2	2.34,88	8,12		16.15,00	107.29.4,65	☉.
	69.55.43,53				2.39,37	8,15			107.29.8,03	☉.
	69.6.24,82	29,940	31,7	33,0	2.37,21	8,10		16.14,90	107.12.17,11	☉.
	69.38.50,55				2.41,70	8,13			107.12.17,50	☉.
	69.21.44,70	29,992	33,8	35,6	2.38,69	8,12		16.14,70	106.55.8,85	☉.
	68.49.20,52				2.34,33	8,09			106.55.9,74	☉.
	67.5.28,73		34,3	35,0	2.21,84	4,72	10,669	5,71	104.54.48,42	Venus.
	72.13.38,17	30,334	42,7	39,8	3.6,35	0,80	10,880	7,74	110.3.44,26	Saturn.
	7.30.27,73	30,388	43,6	44,0	7,91				45.17.43,92	α Cygni R.
	7.30.27,91								45.17.44,10	α Cygni.
10,87	65.23.20,88	30,374	45,0	45,1	2.9,86	7,87		16.12,70	103.28.43,85	☉.
	65.55.44,06				2.13,13	7,90			103.28.44,87	☉.
	65.35.35,20	29,784	47,3	49,2	2.7,46	7,88		16.12,50	103.8.30,56	☉.
	65.3.13,31				2.4,37	7,85			103.8.30,61	☉.
	6.22.54,04	29,900	44,4	43,2	6,61				44.10.8,93	Capella R.
12,39	6.22.52,59	29,918	43,8	43,0	31,26	2,18			44.10.7,48	Capella.
	27.51.13,59	29,940	39,3	37,0	3.5,19	0,80	10,960	8,58	65.38.50,95	Vesta.
	72.14.29,49	29,966	43,0	43,3	7,81				110.4.33,58	Saturn.
	7.30.26,68								45.17.42,77	α Cygni R.
	7.30.28,28				3.1,91	6,40			45.17.44,37	α Cygni.
11,89	72.8.53,84								109.58.57,63	Mercury.
	64.42.44,87	29,962	45,2	45,5	2.4,15	7,82		16.12,30	102.48.1,78	☉.
	65.15.7,04				2.7,20	7,86			102.48.2,36	☉.
	27.49.8,48	29,800	42,5	41,3	31,21	2,16			65.36.45,81	Vesta.
	64.54.32,78	29,434	43,3	43,8	2.3,49	7,83		16.12,10	102.27.24,62	☉.
	64.22.12,11				2.0,55	7,80			102.27.25,24	☉.
	60.45.58,98		43,8	44,1	1.43,42	4,55	10,672	5,69	98.34.40,44	Venus.
	6.22.52,89	29,400	38,4	38,0	6,57				44.10.7,74	Capella R.
	6.22.53,49								44.10.8,34	Capella.
	27.47.4,63		38,6	37,0	31,02	2,15			65.34.41,78	Vesta.
12,51	6.22.52,04	29,556	34,0	30,2	6,69				44.10.7,01	Capella R.
12,40	6.22.53,88								44.10.8,85	Capella.
	23.44.19,93				26,32				61.31.54,53	β Tauri R.
11,45	23.44.21,54								61.31.56,14	β Tauri.
	52.36.57,39				1.18,18				90.25.23,85	δ Orionis R.
	52.36.57,11								90.25.23,57	δ Orionis.
	27.43.0,63	29,580	33,8	29,7	31,60	2,12			65.30.38,39	Vesta.
	32.32.1,44	29,440	35,3	34,8					69.32.2,85	☾.
	32.32.1,35								69.32.2,76	☾.
	32.32.1,12				37,77	31.36,83		16.7,81	69.32.2,53	☾.
	32.32.1,08								69.32.2,49	☾.
	32.32.0,54								69.32.1,95	☾.
	27.41.2,19	29,426	34,8	33,4	31,15	2,10			65.28.39,52	Vesta.
	27.39.4,38	29,762	36,5	36,0	31,29	2,09			65.26.41,86	Vesta.
	62.36.12,93	30,190	36,7	37,1	1.56,15	7,67		16.11,10	100.41.20,79	☉.
	58.17.49,93	30,172	37,0	38,0	1.37,34	4,47	10,677	5,75	96.6.25,33	Venus.

Coincidence of Micrometer Wire with fixed Wire = 10',122 at middle Wire. From Feb. 12 = 10',120, 10',123, 10',128, 10',134, 10',138 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = + 1'',0. From Feb. 12 = + 3'',3.

Adopted Zenith Point = 43°.27'.12'',35. From Feb. 12 = 43°.27'.11'',59.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.	Microscopes.						Micrometer, or Time by Molyneux.	Correction for Microm. or Time.	Concluded reading of Circle.	Observer.
			A	B	C	D	E	F				
			° ' "	° ' "	° ' "	° ' "	° ' "	° ' "				
Feb. 21	(a) S.L. M.....	68.35	2.32,9	37,8	39,0	37,3	42,8	36,2	10,980	-17,95 -2,90	68.37.17,10	G.
	» S.L. M.....	68.35	2.32,9	37,8	39,0	37,3	42,8	36,2	11,048	-19,31 -1,45	68.37.17,19	G.
	» S.L. M.....	68.35	2.32,9	37,8	39,0	37,3	42,8	36,2	11,127	-20,86	68.37.17,09	G.
	» S.L. M.....	68.35	2.32,9	37,8	39,0	37,3	42,8	36,2	11,242	-23,13 +1,45	68.37.16,27	G.
	» S.L. M.....	68.35	2.32,9	37,8	39,0	37,3	42,8	36,2	11,309	-24,44 +2,90	68.37.16,41	G.
Feb. 22	Mercury; center...	112.25	1.40,7	45,8	48,0	46,8	48,7	40,0			112.26.45,20	G.
Feb. 23	(b) N.L.....	67.55	0.17,5	20,8	21,8	22,6	25,2	22,3	10,025	+2,66	67.55.24,39	G.
	» N.L. M.....	67.55	0.17,5	20,8	21,8	22,6	25,2	22,3		+2,05 +1,33	67.55.25,11	G.
	» N.L. M.....	67.55	0.17,5	20,8	21,8	22,6	25,2	22,3		+3,78	67.55.25,51	G.
	» N.L. M.....	67.55	0.17,5	20,8	21,8	22,6	25,2	22,3	9,947	+4,38	67.55.24,78	G.
	» N.L. M.....	67.55	0.17,5	20,8	21,8	22,6	25,2	22,3	9,924	-1,33		
	» N.L. M.....	67.55	0.17,5	20,8	21,8	22,6	25,2	22,3	9,881	+5,36 -2,66	67.55.24,43	G.
	» Geminorum.....	67.30	2.42,8	45,2	47,7	45,9	49,1	43,9	6,434	+1.17,09	67.32.46,07	G.
	» Castor R. M.....	203.25	2.31,2	35,0	33,5	37,8	37,3	35,4			203.28.52,41	G.
	» Castor.....	63.25	0.22,8	26,4	27,3	27,8	29,5	28,7			63.25.27,13	G.
	» Pollux R. M.....	199.35	3.23,4	28,0	26,0	28,7	29,3	28,1	7,510	+54,65	199.39.22,28	G.
	» Pollux.....	67.10	4.52,9	57,1	58,4	55,0	61,2	53,8	9,748	+7,93	67.14.56,95	G.
	» γ Ursæ Maj. R. M.	225.45	4.15,8	18,7	16,5	20,0	20,8	16,4			225.49.26,43	G.
	» γ Ursæ Majoris...	41.0	4.52,4	54,0	58,2	55,8	55,4	50,8			41.4.54,97	G.
	» Mars N.L.....	90.40	5.6,7	9,5	11,0	10,5	12,8	7,3	18,998	-3.5,15	90.45.10,20	G.
	» * R. 12 <sup>h</sup> .3 <sup>m</sup> .28 <sup>s</sup> M	90.40	5.6,7	9,5	11,0	10,5	12,8	7,3			90.42.5,05	G.
Feb. 24	Saturn S.L.....	115.40	4.25,8	29,5	30,6	30,8	31,7	26,3			115.44.29,62	G.
Feb. 25	Vesta.....	70.55	1.47,1	49,8	52,0	50,1	51,1	48,8	9,987	+6,40	70.56.50,02	G.
	(b) » N.L.....	74.10	4.28,0	30,7	34,8	30,7	33,3	29,8		+2,85 +3,20	74.14.38,12	G.
	» N.L. M.....	74.10	4.28,0	30,7	34,8	30,7	33,3	29,8		+6,01	74.14.37,77	G.
	» N.L. M.....	74.10	4.28,0	30,7	34,8	30,7	33,3	29,8	9,840	+8,85	74.14.37,73	G.
	» N.L. M.....	74.10	4.28,0	30,7	34,8	30,7	33,3	29,8	9,710	-3,20	74.14.37,37	G.
	» N.L. M.....	74.10	4.28,0	30,7	34,8	30,7	33,3	29,8	9,568	+11,90 -6,40	74.14.37,22	G.
	» λ Leonis.....	71.55	4.0,6	4,0	7,1	4,2	5,8	0,8	2,420	+2.40,89	71.59.4,20	G.
	» o Leonis.....	85.0	1.52,2	56,2	59,7	56,4	57,0	54,0			85.1.56,13	G.
	» Regulus R. M.....	183.55	2.20,5	25,8	26,1	27,3	26,5	25,8			184.0.6,49	G.
	» Regulus.....	82.50	4.9,4	13,0	16,5	13,8	14,2	9,4	4,889	+1.49,36	82.54.13,18	G.
	» α Ursæ Maj. R. M.	233.45	4.16,0	21,2	20,6	20,8	21,0	17,6			233.51.9,36	G.
	» α Ursæ Majoris...	33.0	3.12,0	15,8	15,4	15,0	14,9	12,5			33.3.14,62	G.
	(c) » Mars N.L.....	90.25	4.59,0	61,0	65,3	65,5	63,4	64,7			90.30.3,15	G.
	» Saturn N.L.....	115.40	4.18,5	22,0	23,0	22,7	22,3	18,4			115.44.21,62	G.
Feb. 26	☉ S.L. M.....	104.45	1.17,1	22,0	20,8	21,9	21,6	20,0	11,919	-37,38	104.45.43,34	G.
	☉ N.L.....	104.10	3.22,9	28,8	26,7	27,8	28,4	23,4	7,725	+50,16	104.13.26,72	G.
	(d) » Venus S.L.....	99.10	2.54,8	60,8	60,2	60,0	61,8	55,3			99.12.59,15	G.
	» β Leonis R. M....	186.40	2.13,4	20,8	19,0	21,8	20,0	20,3			186.43.9,63	G.
	» β Leonis.....	80.10	1.5,8	10,0	12,9	10,8	11,3	10,0	7,155	+1.2,06	80.11.10,27	G.
	» γ Ursæ Maj. R. M.	225.45	3.24,7	28,3	26,6	27,8	28,2	26,1			225.49.29,39	G.
	» γ Ursæ Majoris...	41.0	4.52,1	54,9	58,0	54,7	56,0	51,0			41.4.54,98	G.
	(e) » * R. 11 <sup>h</sup> .50 <sup>m</sup> .17 <sup>s</sup> M.	90.25	0.22,0	27,2	28,7	28,7	26,1	29,0	12,027	-39,64	90.24.47,36	G.
	(e) » Mars S.L. M.....	90.25	0.22,0	27,2	28,7	28,7	26,1	29,0	18,572	-2.56,24	90.22.30,76	G.

(a) At the five wires; very hazy.

(b) At the five wires.

(c) No correction for runs.

(d) Cloudy.

(e) The planet was in the field of view at the same time as the star: both limbs were taken on the micrometer wire, a very few seconds one after the other.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
	25.10. 5,51	30,140	36,3	34,8					62.17.27,97	♃.
	25.10. 5,60								62.17.28,06	♃.
	25.10. 5,50				28,49	24.26,42		15.47,89	62.17.27,96	♃.
	25.10. 4,68								62.17.27,14	♃.
	25.10. 4,82								62.17.27,28	♃.
	68.59.33,61	29,514	43,8	44,9	2.30,25	5,99			106.49. 6,15	Mercury.
	24.28.12,80	29,638	41,8	40,7					62. 7.57,71	♃.
	24.28.13,52								62. 7.58,43	♃.
	24.28.13,92				26,81	23.18,67		15.28,49	62. 7.58,83	♃.
	24.28.13,19								62. 7.58,10	♃.
	24.28.12,84								62. 7.57,75	♃.
	24. 5.34,48				26,33				61.53. 9,09	♊ Geminorum.
9,77	19.58.19,18				21,41				57.45.48,87	♊ Castor R.
	19.58.15,54								57.45.45,23	♊ Castor.
9,62	23.47.40,31				25,97				61.35.23,56	♊ Pollux R.
	23.47.45,36								61.35.19,61	♊ Pollux.
10,70	-2.22.14,84	29,666	38,0	37,2	2,46				35.24.50,98	♊ U. Majoris R.
	-2.22.16,62								35.24.49,20	♊ U. Majoris.
	47.17.58,61				1. 4,28	8,92	9,332	8,31	85. 6.10,56	Mars.
	47.14.53,46				1. 4,17				85. 3. 5,91	* R. 12 <sup>h</sup> .3 <sup>m</sup> .28 <sup>s</sup> .
	72.17.18,03	29,524	40,2	37,9	3. 2,79	0,81	10,900	8,06	110. 7.20,23	Saturn.
	27.29.38,43	29,732	40,0	38,2	30,91	2,02			65.17.15,60	Vesta.
	30.47.26,53	29,780	37,8	37,4					68.22. 2,10	♃.
	30.47.26,18								68.22. 1,75	♃.
	30.47.26,14				35,50	28.19,68		15.11,47	68.22. 1,71	♃.
	30.47.25,78								68.22. 1,35	♃.
	30.47.25,63								68.22. 1,20	♃.
	28.31.52,61			37,2	32,41				66.19.33,30	♊ Leonis.
	41.34.44,54				52,85				79.22.45,67	♊ Leonis.
9,84	39.27. 5,10	29,818	37,5	36,6	49,15				77.15. 2,53	Regulus R.
	39.27. 1,59								77.14.59,02	Regulus.
11,99	-10.23.57,77				10,97				27.22.59,54	♊ U. Majoris R.
	-10.23.56,97								27.23. 0,34	♊ U. Majoris.
	47. 2.51,56	29,848	36,5	35,4	1. 4,35	8,98	9,408	7,52	84.51. 2,73	Mars.
	72.17.10,03	29,900	37,3	34,5	3. 6,42	0,81	9,276	8,89	110. 7.32,81	Saturn.
	61.18.31,75	29,940	39,0	40,8	1.48,29	7,57		16. 9,90	98.51.10,85	☉.
	60.46.15,13				1.45,93	7,53			98.51.11,71	☉.
	55.45.47,56	29,930	40,4	42,3	1.26,90	4,37	10,664	5,62	93.34.12,75	Venus.
9,95	36.44. 1,96	29,826	36,2	35,0	44,74				74.31.54,98	♊ Leonis R.
	36.43.58,68								74.31.51,70	♊ Leonis.
12,19	-2.22.17,80				2,48				35.24.48,00	♊ U. Majoris R.
	-2.22.16,61								35.24.49,19	♊ U. Majoris.
	46.57.35,77				1. 4,16			7,29	84.45.48,21	* R. 11 <sup>h</sup> .50 <sup>m</sup> .17 <sup>s</sup> .
	46.55.19,17				1. 4,08	9,01	19,270		84.43.15,23	Mars.

Coincidence of Micrometer Wire with fixed wire = 10',120, 10',123, 10',128, 10',134, 10',138 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = + 3'',3.

Adopted Zenith Point = 43°.27'.11'',59.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.	Microscopes.						Micrometer, or Time by Molyneux.	Correction for Microm. or Time.	Concluded reading of Circle.	Observer.
			A	B	C	D	E	F				
			° ' "	° ' "	° ' "	° ' "	° ' "	° ' "				
Feb. 27	☉ N.L. M.....	103.50	1. 9,8	15,1	14,0	16,4	15,2	13,3	10,723	- 12,42	103.51. 1,68	G.
	(a) ☉ S.L.....	104.20	3. 16,0	24,0	20,8	21,8	22,2	17,8			104.23. 20,80	G.
	Vesta.....	70.50	3. 12,7	15,2	16,0	14,1	16,4	12,5	9,738	+ 8,14	70.53. 14,83	G.
	♂ U. Min. SP. R. M.	264.35	3. 14,8	18,7	18,3	20,3	18,8	18,4			264.38. 26,72	G.
	♂ U. Min. SP. R. M.	2.15	0. 53,0	55,8	58,9	57,0	58,0	56,2	16,173	- 2. 6,17	2. 15. 56,58	G.
	♂ Dracon. SP. R. M.	283.50	2. 18,7	22,7	23,0	23,6	23,3	22,8			283.50. 16,43	G.
	♂ Draconis SP.....	343. 0	4. 2,0	4,0	6,5	4,9	6,9	3,1	9,960	+ 7,90	343. 4. 5,02	G.
	(b) ☉ N.L.....	84.30	1. 28,3	33,9	34,1	34,3	33,8	33,0			84.31. 40,97	G.
	☉ N.L. M.....	84.30	1. 28,3	33,9	34,1	34,3	33,8	33,0	9,773	+ 3,40	84.31. 40,42	G.
	☉ N.L. M.....	84.30	1. 28,3	33,9	34,1	34,3	33,8	33,0		+ 3,95	84.31. 40,47	G.
	☉ N.L. M.....	84.30	1. 28,3	33,9	34,1	34,3	33,8	33,0	9,634	+ 7,40	84.31. 40,47	G.
	☉ N.L. M.....	84.30	1. 28,3	33,9	34,1	34,3	33,8	33,0		+ 10,44	84.31. 39,56	G.
	☉ N.L. M.....	84.30	1. 28,3	33,9	34,1	34,3	33,8	33,0	9,388	- 3,95	84.31. 39,56	G.
	☉ N.L. M.....	84.30	1. 28,3	33,9	34,1	34,3	33,8	33,0		+ 15,65	84.31. 40,82	G.
	♄ Leonis.....	84.15	0. 29,1	35,2	36,2	37,0	37,0	36,4	10,989	- 7,90	84.15. 35,22	G.
	♄ Ursæ Maj. R. M.	233.50	1. 22,1	28,1	27,0	28,3	26,9	27,4		- 17,97	233.51. 8,81	G.
	♄ Ursæ Majoris...	33. 0	3. 10,1	15,5	15,8	14,0	15,0	12,4	9,544	+ 12,19	33. 3. 14,15	G.
	♄ Leonis.....	87.25	1. 51,0	57,3	59,3	57,1	55,4	54,9		10,608	87.26. 56,05	G.
	Mars N.L.....	90.10	4. 18,7	22,4	24,8	22,0	23,2	19,7		- 10,02	90.14. 22,28	G.
	* R. 11 <sup>h</sup> . 59 <sup>m</sup> . 20 <sup>s</sup> .	90.10	4. 18,7	22,4	24,8	22,0	23,2	19,7	9,544	+ 12,19	90.14. 34,47	G.
	M.....	90.10	4. 18,7	22,4	24,8	22,0	23,2	19,7		10,608	90.14. 34,47	G.
	♄ Cephei R. M.....	233. 5	3. 23,8	26,5	25,0	27,1	27,5	25,5	10,608	- 10,02	233. 8. 16,25	G.
	♄ Cephei.....	33.45	1. 2,8	7,0	8,1	6,8	9,0	4,4		- 10,02	33.46. 6,47	G.
	(c) Mercury, center...	109.40	4. 21,7	29,3	25,2	28,8	29,0	24,0			109.44. 26,82	G.
Feb. 28	☉ S.L. M.....	104. 0	1. 20,2	29,4	25,4	29,3	27,4	24,0	12,065	- 40,44	104. 0. 45,66	G.
	☉ N.L.....	103.25	3. 25,3	35,0	28,0	32,0	32,0	26,5		- 40,44	103.28. 30,18	G.
	Venus S.L.....	98.10	1. 18,0	26,2	23,3	26,0	25,8	21,7	9,967	+ 4,06	98.11. 23,65	G.
	♄ Leonis.....	87.25	1. 51,2	57,9	57,4	57,4	57,8	54,9		+ 3,36	87.26. 56,32	G.
	(d) ☉ S.L.....	90.50	2. 3,8	8,1	9,0	8,4	9,0	5,8	9,809	+ 6,78	90.52. 11,64	G.
	☉ S.L. M.....	90.50	2. 3,8	8,1	9,0	8,4	9,0	5,8		- 4,06	90.52. 10,94	G.
	☉ S.L. M.....	90.50	2. 3,8	8,1	9,0	8,4	9,0	5,8	9,586	+ 11,52	90.52. 10,30	G.
	☉ S.L. M.....	90.50	2. 3,8	8,1	9,0	8,4	9,0	5,8		- 8,12	90.52. 10,98	G.
	Mars S.L.....	90. 5	1. 29,0	32,8	33,0	34,8	33,4	32,5	9,968	+ 8,14	90. 6. 32,75	G.
	Mars N.L.....	89.55	3. 5,8	8,3	9,6	9,5	11,0	6,8		+ 3,23	89.58. 8,85	G.
Mar. 1	(e) ☉ S.L.....	96.50	0. 4,7	10,0	10,3	12,6	12,3	10,7	9,857	+ 4,07	96.50. 18,26	G.
	☉ S.L. M.....	96.50	0. 4,7	10,0	10,3	12,6	12,3	10,7		+ 5,65	96.50. 17,42	G.
	☉ S.L. M.....	96.50	0. 4,7	10,0	10,3	12,6	12,3	10,7	9,639	+ 10,33	96.50. 15,77	G.
	☉ S.L. M.....	96.50	0. 4,7	10,0	10,3	12,6	12,3	10,7		- 4,07	96.50. 16,38	G.
	☉ S.L. M.....	96.50	0. 4,7	10,0	10,3	12,6	12,3	10,7	9,430	+ 14,78	96.50. 16,76	G.
	☉ S.L. M.....	96.50	0. 4,7	10,0	10,3	12,6	12,3	10,7		- 8,14	96.50. 16,76	G.
Mar. 4	(a) ☉ S.L. M.....	102.25	4. 15,9	23,5	19,0	23,8	22,3	17,8	9,660	+ 9,66	102.29. 30,31	G.
	☉ N.L.....	101.55	2. 12,7	20,8	15,6	20,2	17,5	16,2		+ 9,66	101.57. 17,32	G.
	Venus S.L.....	96. 5	2. 22,8	27,8	25,3	27,3	28,2	25,4	11,078	- 19,93	96. 7. 26,28	G.
Mar. 6	♄ Ursæ Maj. R. M.	233.50	1. 28,5	36,5	32,5	33,5	31,7	32,5	11,078	- 19,93	233.51. 12,70	G.
	♄ Ursæ Majoris...	33. 0	3. 12,2	17,9	14,8	12,3	12,4	11,4		- 19,93	33. 3. 13,70	G.
	Mars S.L.....	89.15	1. 14,1	19,8	19,0	17,3	14,9	18,2	12,064	- 40,51	89.16. 17,30	G.
Mar. 8	☉ S.L. M.....	100.55	2. 18,0	25,3	23,8	24,5	24,0	22,3		- 40,51	100.56. 42,62	G.
	☉ N.L.....	100.20	4. 26,1	32,8	31,3	32,3	31,2	28,3		- 45,03	100.24. 30,62	G.
	Venus S.L.....	94. 0	3. 0,0	8,3	6,8	7,0	6,8	3,3	12,280	- 45,03	94. 3. 5,57	G.
	Vesta M.....	70.35	4. 19,0	26,3	22,8	24,0	23,0	22,8		- 45,03	70.38. 38,39	G.
	Mars S.L.....	88.55	4. 5,0	10,3	11,1	8,8	9,9	7,0			88.59. 8,95	G.

Coincidence at middle wire and Runs taken March 11, 2<sup>h</sup>. (Temp. 41°).

- (a) Cloudy.  
 (b) At the five wires.  
 (c) Faint and blurrish.

- (d) At the 2nd, 3rd, 4th and 5th wires; hazy.  
 (e) At the five wires; misty and indistinct.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
11,65	60.23.50,09	29,726	44,0	44,6	1.42,78	7,50		16. 9,70	98.28.43,35	☉.
	60.56. 9,21				1.45,05	7,54			98.28.45,30	☉.
	27.26. 3,24	29,790	40,0	38,0	30,90	1,99			65.13.40,43	Vesta.
	-41.11.15,13				52,06				-3.24.58,91	δ U. Min. SP. R.
	-41.11.15,01								-3.24.58,79	δ Urs. Min. SP.
	-60.23. 4,84	29,820	38,5	37,2	1.44,66				-22.37.41,22	δ Dracon. SP. R.
	-60.23. 6,57								-22.37.42,95	δ Draconis SP.
	41. 4.29,38	29,880	38,0	36,3					78.31.35,70	♃.
	41. 4.28,83								78.31.35,15	♃.
	41. 4.28,88				52,19	35.51,45		14 57,30	78.31.35,20	♃.
11,48	41. 4.27,97								78.31.34,29	♃.
	41. 4.29,23								78.31.35,55	♃.
	40.48.23,63				51,70				78.36.23,61	ι Leonis.
	-10.23.57,22				11,00				27.23. 0,06	α Ursæ Maj. R.
	-10.23.57,44				57,81				27.22.59,84	α Ursæ Majoris.
	43.59.44,46	29,900	37,5	35,8	1. 3,82	9,03	9,380	7,81	81.47.50,55	χ Leonis.
	46.47.10,69				1. 3,83				84.35.21,57	Mars.
	46.47.22,88								84.35.34,99	*R.11 <sup>h</sup> .59 <sup>m</sup> .20 <sup>s</sup> .
	-9.41. 4,66	30,088	41,0	42,4	10,17				28. 5.53,45	α Cephei R.
	-9.41. 5,12				2.14,13	5,77			28. 5.52,99	α Cephei.
11,36	66.17.15,23		43,3	45,0					104. 6.31,87	Mercury.
	60.33.34,07	30,093	44,1	46,0	1.44,43	7,51		16. 9,50	98. 6. 9,77	☉.
	60. 1.18,59				1.42,20	7,47			98. 6.11,10	☉.
	54.44.12,06	30,072	45,0	46,5	1.23,33	4,33	10,682	5,81	92.32.33,53	Venus.
	43.59.44,73	30,026	41,6	40,6	57,57				81.47.50,58	χ Leonis.
	47.25. 0,05								84.18.23,68	♃.
	47.24.59,35								84.18.22,98	♃.
	47.24.58,71				1. 4,86	39.57,85		14.51,66	84.18.22,34	♃.
	47.24.59,39								84.18.23,02	♃.
	46.39.21,16	30,012	40,8	39,8	1. 3,23	9,06	10,830	7,33	84.27.16,28	Mars.
13,20	46.30.57,26	29,762	41,8	41,3	1. 2,21	9,07	9,430	7,29	84.19. 5,97	Mars.
	53.23. 6,67								90.13.24,45	♃.
	53.23. 5,83								90.13.23,61	♃.
	53.23. 4,18				1.19,34	43.22,55		14.47,29	90.13.21,96	♃.
	53.23. 4,79								90.13.22,57	♃.
	53.23. 5,17								90.13.22,95	♃.
	59. 2.18,72	30,024	42,7	42,8	1.38,71	7,39		16. 8,40	96.34.49,92	☉.
	58.30. 5,73				1.36,66	7,34			96.34.51,73	☉.
	52.40.14,69		42,7	43,0	1.17,72	4,25	10,631	5,34	90.28.31,10	Venus.
	-10.24. 1,11	29,600	28,5	27,6	11,10				27.22.56,07	α Ursæ Maj. R.
13,20	-10.23.57,89								27.22.59,29	α Ursæ Majoris.
	45.49. 5,71	29,586	28,8	27,7	1. 2,11	9,13	10,908	8,19	83.36.58,78	Mars.
	57.29.31,03	29,750	33,8	32,9	1.34,05	7,25		16. 7,40	95. 1.58,71	☉.
	56.57.19,03				1.32,15	7,21			95. 1.59,65	☉.
	50.35.53,98	29,772	34,0	33,5	1.13,01	4,16	10,738	6,46	88.24. 4,65	Venus.
	27.11.26,80	29,836	32,4	29,6	31,17	1,87			64.59. 4,38	Vesta.
	45.31.57,36	29,850	29,0	26,5	1. 2,21	9,12	10,876	7,86	83.19.50,87	Mars.

Coincidence of Micrometer Wire with fixed Wire = 10', 120, 10', 123, 10', 128, 10', 134, 10', 138 at the five wires.

From March 4, = 10', 123 at the middle wire.

One Micrometer Revolution = 20'', 873.

Correction for Runs = + 3'', 3. From March 4 = + 1'', 9.

Adopted Zenith Point = 43°. 27'. 11'', 59.

Assumed Co-latitude 37°. 47'. 8'', 28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  h. m. s.	Correction for Microm. or Time.  " "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			" "	" "	" "	" "	" "	" "				
Mar. 8	$\alpha$ Cephei R. M....	233. 5	3. 14,8	21,4	20,6	19,9	22,9	19,8	10,424	- 6,28	233. 8. 13,84	G.
	$\alpha$ Cephei.....	33. 45	1. 5,5	11,3	12,1	9,0	11,0	9,8			33. 46. 9,87	G.
Mar. 9	$\odot$ N.L. M.....	100. 0	1. 20,2	26,2	26,2	27,3	27,4	26,3	10,930	- 16,85	100. 1. 8,83	G.
	$\odot$ S.L.....	100. 30	3. 14,3	21,3	21,0	21,0	21,4	18,2			100. 33. 19,75	G.
	$\alpha$ Ursæ Maj. R. M.	233. 50	2. 19,1	26,2	23,9	23,3	26,0	24,0	13,514	- 1. 10,78	233. 51. 13,12	G.
	$\alpha$ Ursæ Majoris...	33. 0	3. 8,8	14,5	15,0	10,3	14,8	11,8			33. 3. 12,73	G.
	(a) Mars N.L.....	88. 50	0. 11,8	19,6	20,3	19,7	19,0	21,5			88. 50. 18,67	G.
	* $\mathcal{R}$ . 11 <sup>h</sup> . 39 <sup>m</sup> . 23 <sup>s</sup> M	88. 50	0. 11,8	19,6	20,3	19,7	19,0	21,5	4,883	+ 1. 48,62	88. 52. 7,29	G.
	$\gamma$ Ursæ Maj. R. M.	225. 50	0. 11,8	20,3	18,0	18,9	19,8	20,8	12,443	- 48,43	225. 49. 29,85	G.
	(b) $\gamma$ Ursæ Majoris...	41. 0	4. 47,2	53,3	55,3	52,4	52,7	52,9			41. 4. 52,30	G.
	(b) * $\mathcal{R}$ . 11 <sup>h</sup> . 50 <sup>m</sup> . 17 <sup>s</sup>	90. 20	4. 40,8	49,0	49,5	47,0	49,8	49,8			90. 24. 47,65	G.
	* $\mathcal{R}$ . 11 <sup>h</sup> . 59 <sup>m</sup> . 20 <sup>s</sup>	90. 10	4. 27,8	34,8	34,5	31,4	36,4	31,1			90. 14. 32,95	G.
	* $\mathcal{R}$ . 12 <sup>h</sup> . 3 <sup>m</sup> . 28 <sup>s</sup>	90. 40	1. 56,5	63,2	64,9	61,7	63,0	62,3			90. 42. 2,07	G.
	Polaris SP. R. M..	262. 45	1. 19,8	28,9	27,0	27,3	27,5	27,8	10,780	- 13,71	262. 46. 12,76	G.
	Polaris SP.....	4. 5	3. 10,1	15,0	17,3	12,4	17,1	13,9			4. 8. 14,50	G.
	Jupiter N.L.....	100. 45	3. 12,0	20,0	19,8	18,3	19,1	16,5			100. 48. 17,82	G.
Mar. 11	(c) $\odot$ N.L.....	99. 10	4. 9,3	17,8	14,9	14,6	14,9	10,3			99. 14. 13,90	G.
	$\odot$ S.L.....	99. 45	1. 15,0	22,4	21,8	22,8	21,8	21,2			99. 46. 20,92	G.
	(d) Venus S.L.....	92. 25	4. 53,2	60,9	61,1	61,8	61,3	60,2			92. 29. 59,75	G.
	Mars N.L.....	88. 30	3. 16,9	24,1	24,5	24,0	28,0	23,1			88. 33. 23,65	G.
	$\beta$ Leonis R. M....	186. 40	2. 18,3	26,8	25,1	26,8	29,2	26,2	7,930	+ 45,78	186. 43. 11,33	G.
	$\beta$ Leonis.....	80. 10	1. 3,8	10,2	12,8	10,0	13,2	9,0			80. 11. 9,90	G.
	$\gamma$ Ursæ Maj. R. M.	225. 50	0. 26,1	33,2	30,6	34,2	36,4	34,9	13,152	- 1. 3,23	225. 49. 29,37	G.
	(b) $\gamma$ Ursæ Majoris...	41. 0	4. 45,2	52,1	53,0	52,2	54,9	52,8			41. 4. 51,70	G.
	* $\mathcal{R}$ . 11 <sup>h</sup> . 50 <sup>m</sup> . 17 <sup>s</sup> M.	90. 20	4. 4,8	12,3	12,4	11,1	16,3	8,8	8,238	+ 39,34	90. 24. 50,56	G.
	* $\mathcal{R}$ . 11 <sup>h</sup> . 59 <sup>m</sup> . 20 <sup>s</sup>	90. 10	4. 29,0	38,2	36,3	34,8	40,7	32,8			90. 14. 35,58	G.
	* $\mathcal{R}$ . 12 <sup>h</sup> . 3 <sup>m</sup> . 28 <sup>s</sup> ...	90. 40	1. 58,6	66,0	66,8	65,3	66,9	63,2			90. 42. 4,60	G.
	Polaris SP. R. M..	262. 45	1. 37,0	46,5	45,4	45,4	46,9	45,5	11,668	- 32,24	262. 46. 12,31	G.
	Polaris SP.....	4. 5	3. 4,9	11,2	12,2	9,0	16,0	8,4			4. 8. 10,48	G.
	Jupiter N.L.....	100. 40	3. 17,4	24,5	24,8	23,6	26,7	22,2			100. 43. 23,42	G.
Mar. 12	(e) $\odot$ S.L. M.....	99. 20	3. 17,4	26,8	23,8	23,4	25,5	21,0	11,722	- 33,38	99. 22. 49,82	G.
	$\odot$ N.L.....	98. 50	0. 35,8	45,9	42,0	44,0	43,9	41,4			98. 50. 42,22	G.
Mar. 13	(f) $\alpha$ Cephei SP. R. M.	289. 15	4. 11,0	20,0	15,0	16,4	17,2	14,0	13,620	- 1. 12,89 + 0,28	289. 18. 3,26	G.
	(g) $\alpha$ Cephei SP.....	337. 35	1. 13,3	21,5	18,3	19,1	21,2	19,9		- 1,13	337. 36. 17,84	G.
	(h) Mars N.L.....	88. 15	1. 35,8	41,2	41,0	42,5	42,5	41,8			88. 16. 40,90	G.
	$\gamma$ Ursæ Maj. R. M.	225. 45	4. 43,8	52,8	46,2	47,5	51,1	45,3	10,954	- 17,35	225. 49. 30,73	G.
	$\gamma$ Ursæ Majoris...	41. 0	4. 47,0	56,0	52,8	50,2	53,5	47,0			41. 4. 51,38	G.
	(h) Jupiter N.L.....	100. 35	3. 11,2	20,4	16,3	17,3	18,8	14,2			100. 38. 16,58	G.
Mar. 16	$\odot$ S.L. M.....	97. 45	3. 12,2	21,3	16,9	19,4	20,0	14,7	9,954	+ 3,44	97. 48. 21,01	G.
	$\odot$ N.L.....	97. 15	1. 9,1	19,0	15,2	18,7	16,0	14,4			97. 16. 15,47	G.
Mar. 19	Mars N.L.....	87. 25	4. 34,0	43,1	38,8	39,9	40,4	36,5			87. 29. 39,00	G.
	Jupiter N.L.....	100. 20	1. 55,0	62,0	61,3	62,5	61,2	59,1			100. 22. 0,28	G.
Mar. 20	Jupiter S.L.....	100. 15	4. 52,6	62,0	57,6	59,8	60,2	53,4			100. 19. 57,83	G.
Mar. 21	Jupiter N.L.....	100. 15	1. 20,3	27,2	24,8	26,1	26,9	26,0			100. 16. 25,28	G.
Mar. 24	(i) $\mathcal{D}$ N.L. M.....	72. 55	0. 18,5	22,4	23,0	22,7	24,8	22,3	11,191	- 22,50 + 5,96	72. 55. 5,76	G.
	$\mathcal{D}$ N.L. M.....	72. 55	0. 18,5	22,4	23,0	22,7	24,8	22,3	11,088	- 20,29 + 2,98	72. 55. 4,99	G.
	$\mathcal{D}$ N.L. M.....	72. 55	0. 18,5	22,4	23,0	22,7	24,8	22,3	10,948	- 17,31	72. 55. 4,99	G.
	$\mathcal{D}$ N.L. M.....	72. 55	0. 18,5	22,4	23,0	22,7	24,8	22,3	10,829	- 14,76 - 2,98	72. 55. 4,56	G.
	$\mathcal{D}$ N.L. M.....	72. 55	0. 18,5	22,4	23,0	22,7	24,8	22,3	10,702	- 12,05 - 5,96	72. 55. 4,29	G.

Coincidence at middle wire and Runs taken March 20, 23<sup>h</sup>.

- (a) Unsteady and badly defined.  
 (b) No correction for runs.  
 (c) Came on fixed wire; unsatisfactory.  
 (d) Cloudy: no correction for runs.

- (e) Hazy.  
 (f) At 4th wire; blur.  
 (g) At the 5th wire.  
 (i) At the five wires.  
 (h) Cloudy.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
11,86	- 9. 41. 2,25 - 9. 41. 1,72	29,894	31,8	32,0	10,32				28. 5. 55,71 28. 5. 56,24	$\alpha$ Cephei R. $\alpha$ Cephei.
	56. 33. 57,24 57. 6. 8,16	29,910	33,8	34,4	1. 31,00 1. 32,86	7,18 7,22		16. 7,20	94. 38. 36,54 94. 38. 34,88	$\odot$ . $\odot$ .
12,93	- 10. 24. 1,53 - 10. 23. 58,86	30,000	29,0	26,0	11,29				27. 22. 55,46 27. 22. 58,13	$\alpha$ U. Majoris R. $\alpha$ Ursæ Majoris.
	45. 23. 7,08 45. 24. 55,70		28,0	25,8	1. 2,29 1. 2,36	9,12	9,369	7,87	83. 11. 16,40 83. 13. 6,34	Mars. * $\mathcal{R}$ . 11 <sup>h</sup> . 39 <sup>m</sup> . 23 <sup>s</sup>
11,08	- 2. 22. 18,26 - 2. 22. 19,29				2,55				35. 24. 47,47 35. 24. 46,44	$\gamma$ Ursæ Maj. R. $\gamma$ Ursæ Majoris.
	46. 57. 36,06 46. 47. 21,36				1. 5,81 1. 5,42				84. 45. 50,15 84. 35. 35,06	* $\mathcal{R}$ . 11 <sup>h</sup> . 50 <sup>m</sup> . 17 <sup>s</sup> * $\mathcal{R}$ . 11 <sup>h</sup> . 59 <sup>m</sup> . 20 <sup>s</sup>
	47. 14. 50,48				1. 6,47				85. 3. 5,23	* $\mathcal{R}$ . 12 <sup>h</sup> . 3 <sup>m</sup> . 28 <sup>s</sup>
13,63	- 39. 19. 1,17 - 39. 18. 57,09		27,0	26,0	50,33				- 1. 32. 43,22 - 1. 32. 39,14	Polaris SP. R. Polaris SP.
	57. 21. 6,23				1. 35,74	1,58	8,129	20,81	95. 10. 9,48	Jupiter.
	55. 47. 2,31 56. 19. 9,33	30,112	37,0	40,2	1. 27,88 1. 29,66	7,11 7,15		16. 6,60	93. 51. 37,96 93. 51. 33,52	$\odot$ . $\odot$ .
	49. 2. 48,16 45. 6. 12,06	30,106 30,064	39,0 35,4	40,6 35,3	1. 8,85 1. 0,58	4,10 9,10	10,654 9,410	5,59 7,44	86. 50. 55,60 82. 54. 19,26	Venus. Mars.
10,62	36. 44. 0,26 36. 43. 58,31				45,07				74. 31. 53,61 74. 31. 51,66	$\beta$ Leonis. R. $\beta$ Leonis.
10,54	- 2. 22. 17,78 - 2. 22. 19,89				2,50				35. 24. 48,00 35. 24. 45,89	$\gamma$ Ursæ Maj. R. $\gamma$ Ursæ Majoris.
	46. 57. 38,97 46. 47. 23,99				1. 4,63 1. 4,25				84. 45. 51,88 84. 35. 36,52	* $\mathcal{R}$ . 11 <sup>h</sup> . 50 <sup>m</sup> . 17 <sup>s</sup> * $\mathcal{R}$ . 11 <sup>h</sup> . 59 <sup>m</sup> . 20 <sup>s</sup>
	47. 14. 53,01				1. 5,28				85. 3. 6,57	* $\mathcal{R}$ . 12 <sup>h</sup> . 3 <sup>m</sup> . 28 <sup>s</sup>
11,40	- 39. 19. 0,72 39. 19. 1,11	30,048	35,5	34,4	49,52				- 1. 32. 41,96 - 1. 32. 42,35	Polaris SP. R. Polaris SP.
	57. 16. 11,83				1. 33,89	1,58	8,116	20,95	95. 5. 13,37	Jupiter.
	55. 55. 38,23 55. 23. 30,63	30,024	38,0	40,4	1. 28,06 1. 26,32	7,12 7,07		16. 6,40	93. 28. 1,05 93. 28. 4,56	$\odot$ . $\odot$ .
10,55	- 65. 50. 51,67 - 65. 50. 53,75	29,962	59,0	38,7	2. 12,59				- 28. 5. 55,98 - 28. 5. 58,06	$\alpha$ Cephei SP. R. $\alpha$ Cephei SP.
	44. 49. 29,31	29,946			59,34	9,07	9,378	7,77	82. 37. 35,63	Mars.
11,06	- 2. 22. 19,14 - 2. 22. 20,21				2,47				35. 24. 46,67 35. 24. 45,60	$\gamma$ Ursæ Maj. R. $\gamma$ Ursæ Majoris.
	57. 11. 4,99	29,940	39,3	38,4	1. 32,47	1,59	8,124	20,87	95. 0. 5,02	Jupiter.
	54. 21. 9,42 53. 49. 3,88	29,160	47,0	47,6	1. 19,49 1. 17,95	6,97 6,93		16. 5,30	91. 53. 24,92 91. 53. 28,48	$\odot$ . $\odot$ .
	44. 2. 27,41 56. 54. 48,69	29,942 29,930	38,5 37,0	38,0 35,5	57,81 1. 32,05	8,91 1,59	9,388 8,120	7,63 20,87	81. 50. 32,22 94. 43. 48,30	Mars. Jupiter.
	56. 52. 46,24	29,532	42,0	42,0	1. 29,51	1,59	12,173	21,44	94. 41. 1,00	Jupiter.
	56. 49. 13,69	29,512	43,9	43,2	1. 29,00	1,59	8,150	20,55	94. 38. 9,93	Jupiter.
	29. 27. 54,17	29,540	45,5	44,8					67. 3. 32,89	$\mathcal{J}$ .
	29. 27. 53,40								67. 3. 32,12	$\mathcal{J}$ .
	29. 27. 53,40				32,88	27. 15,34		15. 12,90	67. 3. 32,12	$\mathcal{J}$ .
	29. 27. 52,97								67. 3. 31,69	$\mathcal{J}$ .
	29. 27. 52,70								67. 3. 31,42	$\mathcal{J}$ .

Coincidence of Micrometer Wire with fixed Wire = 10',123 at the middle Wire. From March 16 = 10',119.  
For the Moon on March 24, 25 and 27 the Coincidences used at the five Wires were 10',113, 10',116, 10',119,  
10',122, 10',125.

One Micrometer Revolution = 20'',873.

Correction for Runs = + 1'',9. From March 16 = + 1'',4.

Adopted Zenith Point = 43°. 27'. 11'',59.

Assumed Co-latitude = 37°. 47'. 8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  h. m. s.	Correction for Microm. or Time.  ' "	Concluded reading of Circle.  ° ' "	Observer.		
			A	B	C	D	E	F						
			° ' "	° ' "	° ' "	° ' "	° ' "	° ' "						
Mar. 25	(a) ☉ N.L.....	93.40	3.13,4	22,2	17,8	19,8	20,8	16,5	9,952	+ 7,04	93.43.18,57	G.		
	Venus S.L.....	85.25	3.31,1	39,8	35,8	37,3	38,5	34,4			85.28.36,32	G.		
	(b) ☽ N.L.....	77.25	0.38,7	42,9	42,7	42,5	43,1	40,9			77.25.48,87	G.		
	☽ N.L. M.....	77.25	0.38,7	42,9	42,7	42,5	43,1	40,9			+ 3,42	77.25.48,77	G.	
	☽ N.L. M.....	77.25	0.38,7	42,9	42,7	42,5	43,1	40,9			+ 3,52	77.25.48,45	G.	
	☽ N.L. M.....	77.25	0.38,7	42,9	42,7	42,5	43,1	40,9			+ 6,62	77.25.48,45	G.	
	☽ N.L. M.....	77.25	0.38,7	42,9	42,7	42,5	43,1	40,9			+ 9,64	77.25.47,95	G.	
	☽ N.L. M.....	77.25	0.38,7	42,9	42,7	42,5	43,1	40,9			- 3,52	77.25.47,95	G.	
	☽ N.L. M.....	77.25	0.38,7	42,9	42,7	42,5	43,1	40,9			+ 12,96	77.25.47,75	G.	
	☽ N.L. M.....	77.25	0.38,7	42,9	42,7	42,5	43,1	40,9			- 7,04	77.25.47,75	G.	
☽ Leonis.....	82.25	1.41,0	48,2	45,8	46,5	45,7	44,0	9,802	+ 6,62	82.26.45,28	G.			
☽ Leonis.....	78.5	1.40,7	46,1	45,3	44,2	46,5	42,1			78.6.44,23	G.			
☽ Ursæ Maj. R. M.	233.50	1.35,0	41,2	36,6	38,9	38,2	38,5			233.51.16,46	G.			
☽ Ursæ Majoris...	33.0	3.5,0	11,1	8,3	7,0	7,8	5,5			33.3.7,60	G.			
Mar. 26	(c) ☉ S.L. M.....	93.50	3.24,0	33,6	23,8	38,0	25,1			29,7	14,918	- 1.40,17	93.51.48,76	G.
	☉ N.L.....	93.15	4.43,4	52,9	43,8	55,2	45,0			46,1	11,892	- 37,00	93.19.47,58	G.
	Polaris R. M.....	259.40	1.25,9	31,1	29,0	29,8	31,7			28,3			259.40.52,37	G.
	Polaris.....	7.10	3.27,9	35,4	32,2	32,9	38,0			29,7			7.13.32,85	G.
	(d) Mercury, center...	88.0	3.40,0	49,2	42,9	47,4	46,2			42,8			88.3.44,92	G.
	(e) Venus S.L.....	84.55	4.45,2	54,6	50,7	51,0	53,8			46,3			84.59.50,50	G.
	☽ Leonis.....	85.30	1.12,4	21,2	19,0	19,2	20,0	17,8	11,607	- 31,06			85.31.18,33	G.
	☽ Leonis.....	84.15	0.30,6	35,4	37,0	37,2	39,7	36,8					84.15.36,15	G.
	* ♂ R. 10 <sup>h</sup> . 44 <sup>m</sup> . 38 <sup>s</sup> .	31.50	1.50,8	56,1	56,0	56,4	58,2	55,1					31.51.55,52	G.
	☽ Ursæ Maj. R. M.	233.50	1.43,0	49,2	46,5	48,8	48,3	47,6					233.51.16,26	G.
☽ Ursæ Majoris...	33.0	3.0,2	8,2	6,6	6,0	7,3	3,8	33.3.5,50					G.	
(f) ☽ N.L.....	88.20	1.59,7	67,1	64,9	66,2	66,3	63,1	+ 8,00			88.22.12,65	G.		
☽ N.L. M.....	88.20	1.59,7	67,1	64,9	66,2	66,3	63,1	9,937			+ 3,74	88.22.12,39	G.	
☽ N.L. M.....	88.20	1.59,7	67,1	64,9	66,2	66,3	63,1	+ 4,00			88.22.12,39	G.		
☽ N.L. M.....	88.20	1.59,7	67,1	64,9	66,2	66,3	63,1	9,755			+ 7,59	88.22.12,24	G.	
☽ N.L. M.....	88.20	1.59,7	67,1	64,9	66,2	66,3	63,1	9,590			+ 11,11	88.22.11,76	G.	
☽ N.L. M.....	88.20	1.59,7	67,1	64,9	66,2	66,3	63,1		- 4,00	88.22.11,76	G.			
☽ N.L. M.....	88.20	1.59,7	67,1	64,9	66,2	66,3	63,1	9,388	+ 15,39	88.22.12,04	G.			
☽ N.L. M.....	88.20	1.59,7	67,1	64,9	66,2	66,3	63,1		- 8,00	88.22.12,04	G.			
Mars S.L.....	86.35	3.41,0	48,9	46,5	47,7	47,7	44,0	12,075	- 40,83	86.38.46,15	G.			
☽ Leonis.....	88.40	4.32,1	38,0	36,5	37,5	40,0	34,4			88.44.36,63	G.			
* ♂ R. 11 <sup>h</sup> . 16 <sup>m</sup> . 48 <sup>s</sup> .	32.15	3.20,3	24,9	24,8	24,7	27,2	22,2			32.18.24,18	G.			
☽ Leonis.....	95.35	0.0,8	8,1	7,2	9,2	7,9	7,9			95.35.6,85	G.			
☽ Ursæ Maj. R. M.	225.50	0.8,3	16,4	13,5	16,8	17,8	15,8			225.49.33,94	G.			
(g) ☽ Ursæ Majoris...	41.0	4.41,9	49,8	48,0	49,2	49,0	47,7			41.4.47,60	G.			
☽ Cassiopeiæ SP.	295.35	0.17,3	27,3	23,9	25,2	22,8	25,4			19,578	- 3.17,44	295.32.6,39	G.	
R. M.....	331.20	2.8,0	16,9	14,0	15,3	16,1	13,8					331.22.14,12	G.	
☽ Cassiopeiæ SP.	331.20	2.8,0	16,9	14,0	15,3	16,1	13,8					331.22.14,12	G.	
Jupiter N.L.....	99.55	3.56,0	64,0	62,4	61,7	64,2	57,8					99.59.1,20	G.	
Pallas.....	82.35	3.32,0	40,3	37,3	37,3	40,0	34,7			82.38.37,10	G.			
Ceres.....	88.25	1.0,8	10,9	7,2	9,0	7,8	6,8			88.26.7,13	G.			
Mar. 28	☉ S.L. M.....	93.5	0.27,5	35,3	30,6	35,8	33,0	31,2	11,900	- 37,17	93.4.55,10	G.		
	☉ N.L.....	92.30	2.48,0	58,2	52,6	55,9	53,9	51,0			92.32.53,40	G.		
Mar. 30	(h) ☉ S.L. M.....	92.15	3.13,8	20,0	17,4	17,8	18,4	15,0	10,444	- 6,78	92.18.10,49	G.		
	☉ N.L.....	91.45	1.5,2	11,5	10,0	10,7	9,0	8,4			91.46.9,20	G.		
Apr. 5	(i) Jupiter S.L.....	99.30	2.53,3	58,2	56,6	57,8	59,0	54,7			99.32.56,78	G.		
Apr. 6	* ♂ R. 10 <sup>h</sup> . 44 <sup>m</sup> . 38 <sup>s</sup> .	31.50	1.48,9	55,1	53,1	53,0	53,7	53,9	11,158	- 21,67	31.51.53,07	G.		
	☽ Ursæ Maj. R. M.	233.50	1.36,5	43,1	39,0	40,7	40,0	40,2			233.51.18,35	G.		
	☽ Ursæ Majoris...	33.0	3.1,8	8,3	5,1	3,9	5,5	4,2			33.3.5,00	G.		
	Mars S.L.....	85.55	4.53,9	61,2	59,0	58,0	58,2	54,9			85.59.57,85	G.		
	* ♂ R. 11 <sup>h</sup> . 16 <sup>m</sup> . 48 <sup>s</sup> .	32.15	3.20,8	25,6	22,1	22,5	22,8	22,8			32.18.22,98	G.		
	☽ Leonis.....	85.30	1.12,4	21,2	19,0	19,2	20,0	17,8					85.31.18,33	G.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.		
			Attach.	Free.								
"	" ' "	Inch.	"	"	" "	" "	"	" "	" ' "			
12,03	50.16.6,98	29,510	46,5	46,0	1.9,69	6,58	10,710	16.2,90	88.20.21,27	☉.		
	42.1.24,73	29,500	46,3	46,5	52,16	3,75		6,23	79.49.15,19	Venus.		
	33.58.37,28	29,568	41,8	41,3					71.30.47,57	☽.		
	33.58.37,18								71.30.47,47	☽.		
	33.58.36,86				39,54	30.41,52		15.3,99	71.30.47,15	☽.		
	33.58.36,36								71.30.46,65	☽.		
	33.58.36,16								71.30.46,45	☽.		
	38.59.33,69				47,48				76.47.29,45	ν Leonis.		
	34.39.32,64				40,56				72.27.21,48	η Leonis.		
	-10.24.4,87				10,77				27.22.52,64	α Ursæ Maj. R.		
-10.24.3,99							27.22.53,52	α Ursæ Majoris.				
12,61	50.24.37,17	29,800	45,3	48,5	1.10,36	6,59	16.2,60	87.56.46,62	☉.			
	49.52.35,99				1.9,04	6,54		87.56.49,37	☉.			
	-36.13.40,78	29,820	45,7	47,5	42,79			1.32.44,71	Polaris R.			
	-36.13.38,74				57,59	5,05		1.32.46,75	Polaris.			
	44.36.33,33				51,76	3,73		5,54	82.24.34,15	Mercury.		
41.32.38,91		46,2	47,3				79.20.29,68	Venus.				
10,88	42.4.6,74	29,370	46,2	45,2	52,15		38.16,16	79.52.7,17	ρ Leonis.			
	40.48.24,56				49,89			78.36.22,73	ι Leonis.			
	-11.35.16,07				11,86			26.11.40,35	*R.10 <sup>h</sup> .44 <sup>m</sup> .38 <sup>s</sup>			
	-10.24.4,67	29,364	46,0	45,1	10,62			27.22.52,99	α Ursæ Maj. R.			
	-10.24.6,09							27.22.51,57	α Ursæ Majoris.			
	44.55.1,06							82.19.41,55	☽.			
	44.55.0,80							82.19.41,29	☽.			
	44.55.0,65				57,60			14.50,77	82.19.41,14	☽.		
	44.55.0,17								82.19.40,66	☽.		
	44.55.0,45								82.19.40,94	☽.		
10,77	43.11.34,56			44,8	54,28	8,58	10,848	7,61	80.59.20,93	Mars.		
	45.17.25,04				58,38				83.5.31,70	σ Leonis.		
	-11.8.47,41				11,40				26.38.9,47	*R.11 <sup>h</sup> .16 <sup>m</sup> .48 <sup>s</sup>		
	52.7.55,26				1.14,28				89.56.17,82	ν Leonis.		
	-2.22.22,35				2,39				35.24.43,54	γ Ursæ Maj. R.		
	-2.22.23,99								35.24.41,90	γ Ursæ Majoris.		
	-72.4.54,80	29,340	44,5	43,6	2.57,31				-34.20.43,83	α Cassiop.SP. R.		
	-72.4.57,47								-34.20.46,50	α CassiopeiæSP.		
	56.31.49,61				1.27,45	1,60		8,070	21,39	94.20.45,13	Jupiter.	
	59.11.25,51	29,334	44,4	43,4	47,24	3,67				76.59.17,36	Pallas.	
44.58.55,54				57,88	2,93			82.46.58,77	Ceres.			
10,26	49.37.43,51	29,230	48,7	48,9	1.7,08	6,51	16.2,00	87.9.50,36	☉.			
	49.5.41,81				1.5,83	6,46			87.9.51,46	☉.		
	48.50.58,90	29,730	43,6	44,0	1.7,06	6,43		16.1,50	86.23.6,31	☉.		
	48.18.57,61				1.5,81	6,38				86.23.6,82	☉.	
	56.5.46,80	29,942	37,8	36,0	1.29,20	1,59			12,180	21,50	93.54.1,19	Jupiter.
	-11.35.16,91	30,276	35,0	32,2	12,56					26.11.38,81	*R.10 <sup>h</sup> .44 <sup>m</sup> .38 <sup>s</sup>	
	-10.24.8,37				11,25					27.22.48,66	α Ursæ Maj. R.	
	-10.24.4,98				56,16	8,07			7,13	27.22.52,05	α Ursæ Majoris.	
	42.32.47,87				12,08					80.20.37,11	Mars.	
	-11.8.47,00		34,2	31,7						26.38.9,20	*R.11 <sup>h</sup> .16 <sup>m</sup> .48 <sup>s</sup>	

Coincidence of Micrometer Wire with fixed Wire = 10",119 at the middle Wire. From April 5 = 10",120.

One Micrometer Revolution = 20",873.

Correction for Runs = + 1",4. For the Sun only on March 26 = - 0",9. From March 30 = + 1",9.

Adopted Zenith Point = 43°.27'.11",59. From April 5 = 43°.27'.9",98.

Assumed Co-latitude = 37°.47'.8",28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  h. m. s.	Correction for Microm. or Time.  ' "	Concluded reading of Circle.  ° ' "	Observer.			
			A	B	C	D	E	F							
			"	"	"	"	"	"							
			"	"	"	"	"	"							
Apr. 6	γ Ursæ Maj. R. M.	225.45	4.36,5	46,0	38,5	39,2	42,3	37,4	10,243	- 2,57	225.49.37,71	G.			
	γ Ursæ Majoris...	41.0	4.44,7	47,9	47,8	46,0	46,3	43,4			41.4.46,32	G.			
	(a) 42 Virginis.....	86.55	1.31,0	40,2	34,8	35,0	34,7	34,2			86.56.35,08	G.			
	Jupiter S.L.....	99.25	4.52,1	58,2	56,9	54,8	55,1	52,0			99.29.55,17	G.			
	(b) Pallas.....	79.25	1.16,0	19,6	17,8	15,8	16,7	16,9			+ 1,53 79.26.18,75	G.			
	* R. 1 <sup>h</sup> . 17 <sup>m</sup> . 16 <sup>s</sup> . SP. ....	332.10	4.53,9	59,0	56,7	57,0	58,0	53,9			332.14.56,73	G.			
	Ceres.....	87.45	0.23,8	33,0	26,3	26,5	25,5	27,7			87.45.27,17	G.			
Apr. 10	(c) ☉ S.L. M.....	88.5	2.27,0	40,2	32,1	34,1	36,5	53,9	11,158	- 21,67	88.7.12,46	G.			
	☉ N.L.....	87.35	0.8,7	21,5	14,7	17,5	16,5	17,2			87.35.16,03	G.			
	Venus S.L.....	78.25	0.19,3	29,8	25,0	26,6	28,3	25,1			78.25.25,72	G.			
Apr. 11	☉ N.L. M.....	87.10	3.20,0	29,8	26,4	26,1	27,8	24,0	11,010	- 18,58	87.13.7,32	G.			
	☉ S.L.....	87.40	4.54,3	63,8	60,1	58,4	62,8	55,8			87.44.59,52	G.			
	(d) Mercury, center...	78.5	4.30,9	41,3	37,0	35,8	40,9	33,0			78.9.36,78	G.			
	Venus S.L.....	78.0	2.2,2	13,2	9,9	8,9	10,6	5,5			78.2.8,52	G.			
	(e) Jupiter S.L.....	99.15	0.13,8	25,0	19,2	23,2	20,7	22,0			99.15.20,68	G.			
Apr. 16	(f) ☉ S.L.....	85.55	1.14,8	26,0	21,5	23,6	23,5	20,8			85.56.21,65	G.			
	☉ N.L.....	85.20	4.25,5	37,2	31,8	32,5	38,0	28,0			85.24.32,00	G.			
Apr. 17	(g) ☉ N.L. M.....	85.0	3.21,2	32,6	27,0	29,7	31,0	26,9	10,526	- 8,62	85.3.19,31	G.			
	☉ S.L.....	85.35	0.0,0	12,2	6,1	11,8	10,3	9,2			85.35.8,27	G.			
	Venus S.L.....	75.50	2.4,0	14,0	9,8	12,3	14,0	9,0			75.52.10,43	G.			
	Jupiter N.L.....	98.55	2.47,0	53,8	53,0	53,1	56,1	50,8			98.57.52,20	G.			
	Pallas.....	76.35	0.56,1	62,3	63,0	62,8	64,9	61,3			76.36.1,65	G.			
	Ceres.....	87.15	3.12,5	20,4	19,0	18,8	18,8	16,3			87.18.17,52	G.			
	η Ursæ Maj. R. M.	221.20	1.18,0	26,6	21,1	25,0	22,0	23,9			221.21.16,75	G.			
	η Ursæ Majoris...	45.30	3.0,1	7,2	5,2	5,2	4,8	2,7			45.33.4,08	G.			
	(h) Arcturus R. M....	191.10	4.13,8	21,4	19,1	20,9	20,0	19,1			5,234 + 1.41,84	191.16.0,74	G.		
	Arcturus.....	75.35	3.13,0	20,0	18,3	17,9	19,4	17,0			75.38.17,48	G.			
	Apr. 18	☉ S.L. M.....	85.10	4.29,0	40,8	35,8	36,8	38,4			33,2	11,568	- 30,36	85.14.5,14	G.
		☉ N.L.....	84.40	2.7,3	20,4	15,0	17,2	15,6			13,2			84.42.14,70	G.
(i) Venus S.L.....		75.30	2.7,4	19,0	14,4	16,4	17,8	13,2	75.32.14,62	G.					
Apr. 19	☉ N.L. M.....	84.20	1.26,2	37,1	33,2	37,0	37,0	32,9	10,817	- 14,69	84.21.19,16	G.			
	☉ S.L.....	84.50	3.2,0	13,5	10,0	11,2	13,0	6,7			84.53.9,28	G.			
	Venus S.L.....	75.10	2.43,0	52,8	49,7	51,9	53,1	47,9			75.12.49,63	G.			
	(k) ☉ N.L. M.....	68.35	4.38,0	49,0	45,2	45,5	49,8	41,8	10,700	- 12,36	68.39.35,94	G.			
										+ 3,58					
	☉ N.L. M.....	68.35	4.38,0	49,0	45,2	45,5	49,8	41,8	10,642	- 11,11	68.39.35,40	G.			
										+ 1,79					
	☉ N.L. M.....	68.35	4.38,0	49,0	45,2	45,5	49,8	41,8	10,532	- 8,75	68.39.35,97	G.			
									10,460	- 7,13	68.39.35,80	G.			
										- 1,79					
	☉ N.L. M.....	68.35	4.38,0	49,0	45,2	45,5	49,8	41,8	10,313	- 3,97	68.39.37,17	G.			
										- 3,58					
	Castor R. M.....	203.25	3.21,0	28,7	24,8	29,8	29,9	27,2	8,853	+ 26,29	203.28.53,06	G.			
	Castor.....	63.25	0.16,2	28,1	25,2	27,5	27,8	25,7			63.25.25,07	G.			
	Procyon R. M....	176.50	2.20,0	32,8	29,5	33,0	33,3	31,0	7,860	+ 47,02	176.53.16,87	G.			
	Procyon.....	90.0	0.53,4	64,0	63,3	65,9	64,4	61,6			90.1.2,07	G.			
	Mars N.L.....	85.55	0.7,2	17,5	16,2	19,5	18,4	18,0			85.55.16,12	G.			
Jupiter N.L.....	98.50	2.21,8	31,1	27,8	31,5	29,5	28,0	98.52.28,20			G.				
Pallas.....	76.10	0.19,8	26,2	26,0	28,9	29,9	27,8	76.10.26,42			G.				
Polaris SP. R. M..	262.45	0.24,8	36,5	32,3	36,8	34,0	35,4	{ 7,681 13.3.15	+ 50,77 + 0,13	262.46.24,18	G.				
Polaris SP.....	4.5	2.50,8	58,8	56,8	58,7	60,5	55,7			4.7.56,59	G.				
Ceres.....	87.15	0.38,8	47,8	46,8	48,8	47,3	47,0			87.15.46,05	G.				
(l) * R. 1 <sup>h</sup> . 17 <sup>m</sup> . 16 <sup>s</sup> . SP.....	332.10	4.39,2	48,8	46,5	50,5	50,0	49,8		- 0,91	332.14.46,37	G.				

Coincidences at the five wires and Runs taken April 22, 1<sup>h</sup>. (Temp. 53°).  
Molyneux fast on Hardy 1<sup>m</sup>. 25<sup>s</sup>. April 19, 11<sup>h</sup>.

(a) This is the star of R. 12<sup>h</sup>. 47<sup>m</sup>. 7<sup>s</sup> observed on March 27 with the Transit. Its place does not agree with that of A.S.C. 1490. (b) Four intervals past middle wire. Correction for change of N.P.D. + 0<sup>h</sup>. 84. (c) Cloudy. (d) Very faint. (e) Very doubtful from cloudiness. (f) Came on the fixed wire. (g) Misty clouds. (h) Bad blur. (i) Faint. (k) At the five wires. (l) At the 5th wire.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.									
			Attach.	Free.															
"	"	Inch.	"	"	"	"	"	"	"	"									
12,02	- 2.22.27,73	30,276	33,8	31,4	2,54	1,59	12,159	21,29	35.24.38,01	γ Ursæ Maj. R.									
	- 2.22.23,66								35.24.42,08	γ Ursæ Majoris.									
	43.29.25,10		33,7	30,6	58,24				81.17.31,62	42 Virginis.									
	56.2.45,19				1.31,05				93.51.1,64	Jupiter.									
	35.59.8,77				44,60				73.46.58,31	Pallas.									
	- 71.12.13,25	30,426	33,0	30,2	2.59,00	3,34			- 33.28.3,97	{ * R. 1 <sup>h</sup> . 17 <sup>m</sup> .									
	44.18.17,19								59,97	3,66	82.6.21,78	{ 16 <sup>h</sup> . SP.							
												Ceres.							
	44.40.2,48								59,15	5,98	82.12.5,53	⊙.							
	44.8.6,05								58,07	5,93	82.12.4,87	⊙.							
34.58.15,74	30,422	45,7	45,9	41,81	3,37	10,692	6,03	72.45.56,43	Venus.										
43.45.57,34	30,458	42,6	42,9	57,66	5,89	15.58,20		81.49.55,59	⊙.										
44.17.49,54	58,73	5,94	81.49.52,41	⊙.															
34.42.26,80	30,450	44,5	45,2	41,51	6,14			72.30.10,45	Mercury.										
34.34.58,54	41,31	3,35	10,678	5,88	72.22.38,90			Venus.											
55.48.10,70	30,360	37,0	36,4	1.29,58	1,58			12,092	20,58	93.36.26,20	Jupiter.								
42.29.11,67	29,674	50,0	51,4	52,79	5,74		15.56,80		80.1.10,20	⊙.									
41.57.22,02									51,82	5,68	80.1.13,24	⊙.							
41.36.9,33									29,346	51,0	51,3	50,63	5,64	15.56,60		79.39.59,20	⊙.		
42.7.58,29																51,58	5,70	79.39.55,85	⊙.
32.25.0,45																36,19	3,23	10,700	6,17
55.30.42,22	29,350	44,2	42,4	1.24,41	1,57	8,087	21,15	93.19.34,49								Jupiter.			
33.8.51,67	37,95	2,97			70.56.34,93	Pallas.													
43.51.7,54		42,2	55,81	3,59				81.39.8,04	Ceres.										
2.5.53,23	10,42			2,13					39.53.3,64	η Ursæ Maj. R.									
2.5.54,10									39.53.4,51	η Ursæ Majoris.									
32.11.9,24									69.58.54,16	Arcturus R.									
32.11.7,50									69.58.52,42	Arcturus.									
9,11	41.46.55,16	29,420	48,4	51,2	51,09	5,66	15.56,30		79.18.52,57	⊙.									
	41.15.4,72	50,14	5,60	79.18.53,64	⊙.														
	32.5.4,64	29,450	52,6	54,0	35,69	3,21			10,720	6,38	69.52.39,02	Venus.							
	40.54.9,18	29,638	49,5	51,4	49,88	5,56			15.56,00		78.57.57,78	⊙.							
	41.25.59,30	50,82	5,62	78.57.56,78	⊙.														
	31.45.39,65	29,680	51,5	51,8	35,68	3,19	10,703	6,20			69.33.14,22	Venus.							
	25.12.25,96	29,728	51,8	52,6							62.51.25,66	⋯.							
	25.12.25,42										62.51.25,12	⋯.							
	25.12.25,99				27,13	24.14,71	15.39,00		62.51.25,69	⋯.									
	25.12.25,82								62.51.25,52	⋯.									
25.12.27,19						62.51.26,89			⋯.										
19.58.16,92	9,07			20,95						57.45.46,15	Castor R.								
19.58.15,09										57.45.44,32	Castor.								
46.33.53,11							84.22.2,21	Procyon R.											
46.33.52,09							84.22.1,19	Procyon.											
42.28.6,14							29,816	47,8		46,3	53,57	7,36	9,489	6,51	80.16.7,14	Mars.			
55.25.18,22	29,850	46,0	44,3	1.25,22	1,57	8,118	20,82	93.14.10,97	Jupiter.										
32.43.16,44				37,82	2,91			70.30.59,63	Pallas.										
- 39.19.14,20	10,39				48,20				- 1.32.54,12	Polaris SP. R.									
- 39.19.13,39									- 1.32.53,31	Polaris SP.									
43.48.36,07									81.36.37,21	Ceres.									
- 71.12.23,61									- 33.28.6,65	{ * R. 1 <sup>h</sup> . 17 <sup>m</sup> .									
										{ 16 <sup>h</sup> . SP.									

Coincidence of Micrometer Wire with fixed Wire = 10',120. From April 16 = 10',108, 10',110, 10',113, 10',118, 10',123 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = + 1'',9. From April 16, = - 1'',1.

Adopted Zenith Point = 43°.27'.9'',98.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  r. h. m. s.	Correction for Microm. or Time.  ' "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
Apr. 19	ε Cassiop. SP. R. M.	288. 20	2. 12,0	22,0	18,8	23,0	22,0	20,8	17,608	-2. 36,44	288. 19. 43,24	G.
	ε Cassiopeiae SP.	338. 30	4. 31,0	39,1	36,3	39,3	39,9	36,8			338. 34. 36,90	G.
Apr. 20	⊙ S.L. M.	84. 30	2. 15,9	26,1	23,3	24,8	22,1	22,3	9,936	+ 3,70	84. 32. 26,03	G.
	⊙ N.L.	84. 0	0. 27,2	38,0	35,6	37,0	36,3	36,0			84. 0. 35,00	G.
	Venus S.L.	74. 50	3. 51,4	61,4	60,5	60,0	60,7	56,2	9,990	+ 5,54	74. 53. 58,22	G.
	(a) ⊙ N.L.	71. 40	3. 9,0	19,0	18,0	17,5	18,4	14,2			71. 43. 21,44	G.
	⊙ N.L. M.	71. 40	3. 9,0	19,0	18,0	17,5	18,4	14,2	9,864	+ 2,51	71. 43. 21,18	G.
	⊙ N.L. M.	71. 40	3. 9,0	19,0	18,0	17,5	18,4	14,2			71. 43. 21,09	G.
	⊙ N.L. M.	71. 40	3. 9,0	19,0	18,0	17,5	18,4	14,2	9,728	+ 2,77	71. 43. 21,27	G.
	⊙ N.L. M.	71. 40	3. 9,0	19,0	18,0	17,5	18,4	14,2			71. 43. 21,27	G.
	⊙ N.L. M.	71. 40	3. 9,0	19,0	18,0	17,5	18,4	14,2	9,630	+ 5,19	71. 43. 20,65	G.
	⊙ N.L. M.	71. 40	3. 9,0	19,0	18,0	17,5	18,4	14,2			71. 43. 20,65	G.
Apr. 21	(b) ⊙ N.L.	75. 55	3. 2,1	15,0	12,8	12,9	12,0	8,4	9,918	+ 8,14	75. 58. 17,22	G.
	⊙ N.L. M.	75. 55	3. 2,1	15,0	12,8	12,9	12,0	8,4			75. 58. 17,83	G.
	⊙ N.L. M.	75. 55	3. 2,1	15,0	12,8	12,9	12,0	8,4	9,812	+ 4,01	75. 58. 16,70	G.
	⊙ N.L. M.	75. 55	3. 2,1	15,0	12,8	12,9	12,0	8,4			75. 58. 16,37	G.
	⊙ N.L. M.	75. 55	3. 2,1	15,0	12,8	12,9	12,0	8,4	9,488	+ 9,35	75. 58. 16,87	G.
	⊙ N.L. M.	75. 55	3. 2,1	15,0	12,8	12,9	12,0	8,4			75. 58. 16,87	G.
Apr. 22	* R. 9 <sup>h</sup> . 22 <sup>m</sup> . 42 <sup>s</sup> ...	74. 55	1. 23,4	37,0	31,3	33,8	34,2	32,5	9,958	- 6,80	74. 56. 31,98	G.
	(c) ⊙ S.L.	83. 50	1. 25,0	37,5	33,1	37,5	36,3	32,9			83. 51. 33,65	G.
	⊙ N.L.	83. 15	4. 35,9	48,5	45,0	47,0	48,1	40,6	9,810	+ 7,52	83. 19. 44,02	G.
	(d) Venus S.L.	74. 15	2. 44,8	56,9	53,8	56,8	56,3	53,7			74. 17. 53,62	G.
	(e) ⊙ N.L.	81. 0	1. 29,8	41,0	36,8	39,0	40,2	37,8	9,610	+ 3,17	81. 1. 44,89	G.
	⊙ N.L. M.	81. 0	1. 29,8	41,0	36,8	39,0	40,2	37,8			81. 1. 44,30	G.
	⊙ N.L. M.	81. 0	1. 29,8	41,0	36,8	39,0	40,2	37,8	9,437	+ 3,76	81. 1. 43,69	G.
	⊙ N.L. M.	81. 0	1. 29,8	41,0	36,8	39,0	40,2	37,8			81. 1. 44,22	G.
	⊙ N.L. M.	81. 0	1. 29,8	41,0	36,8	39,0	40,2	37,8	9,437	+ 10,61	81. 1. 44,17	G.
	⊙ N.L. M.	81. 0	1. 29,8	41,0	36,8	39,0	40,2	37,8			81. 1. 44,17	G.
Apr. 24	ρ Leonis	85. 30	1. 7,8	19,2	15,6	18,5	17,7	16,8	6,057	+ 1,24,66	85. 31. 15,88	G.
	(c) ⊙ S.L.	83. 10	1. 19,7	29,8	27,6	31,1	29,7	28,3			83. 11. 27,65	G.
	⊙ N.L.	82. 35	4. 33,2	41,8	41,0	40,9	42,6	36,9	7,282	+ 59,10	82. 39. 39,23	G.
	Castor R. M.	203. 25	2. 23,0	33,0	30,0	33,5	32,8	29,7			203. 28. 54,91	G.
	Castor	63. 25	0. 18,1	28,5	26,8	28,1	28,2	27,0	9,902	+ 8,20	63. 25. 26,10	G.
	Procyon R. M.	176. 50	2. 12,0	22,9	20,8	22,8	23,7	21,0			176. 53. 19,55	G.
	Procyon	90. 0	0. 53,8	63,1	63,7	65,0	63,1	61,8	9,720	+ 11,90	90. 1. 1,72	G.
	* R. 9 <sup>h</sup> . 22 <sup>m</sup> . 42 <sup>s</sup> ...	74. 55	1. 23,8	33,0	31,0	32,2	31,2	32,0			74. 56. 30,48	G.
	χ Leonis	87. 25	1. 48,8	57,2	58,8	56,1	55,0		9,548	+ 4,02	87. 26. 55,72	G.
	τ Leonis	91. 50	4. 28,7	37,3	34,9	36,0	37,1	32,2			91. 54. 34,20	G.
	(b) ⊙ N.L.	92. 20	5. 2,0	13,2	9,8	10,0	9,1	5,9	9,288	+ 8,04	92. 25. 16,19	G.
	⊙ N.L. M.	92. 20	5. 2,0	13,2	9,8	10,0	9,1	5,9			92. 25. 16,51	G.
	⊙ N.L. M.	92. 20	5. 2,0	13,2	9,8	10,0	9,1	5,9	12,559	+ 8,20	92. 25. 16,35	G.
	⊙ N.L. M.	92. 20	5. 2,0	13,2	9,8	10,0	9,1	5,9			92. 25. 16,03	G.
	⊙ N.L. M.	92. 20	5. 2,0	13,2	9,8	10,0	9,1	5,9	9,288	+ 17,43	92. 25. 17,54	G.
	⊙ N.L. M.	92. 20	5. 2,0	13,2	9,8	10,0	9,1	5,9			92. 25. 17,54	G.
Apr. 25	β Virginis. M.	92. 55	4. 28,3	38,3	35,0	38,0	35,0	32,3	14,960	- 1,41,17	92. 58. 43,26	G.
	(f) α Virginis	86. 0	1. 32,2	44,2	41,0	42,8	40,3	39,8			86. 1. 40,21	G.
	⊙ N.L. M.	82. 20	1. 32,3	40,2	39,0	40,6	39,8	37,8	14,960	- 1,41,17	82. 19. 57,05	G.
	⊙ S.L.	82. 50	1. 36,9	45,9	45,8	47,9	45,0	44,4			82. 51. 44,25	G.
	(g) Venus S.L.	73. 25	3. 0,0	10,0	8,8	9,1	10,0	4,9			73. 28. 7,02	G.

(a) At the five wires; the 2nd, 3rd and 4th cloudy.

(b) At the five wires; good.

(c) Came on the fixed wire.

(d) Cloudy.

(e) At the five wires.

(f) At the comb; cloudy.

(g) Very unsteady.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	" ' "	Inch.	"	"	" "	" "	"	" "	" ' "	"
10,07	-64.52.33,26	29,858	44,8	43,4	2. 5,18				-27. 7.30,16	ε Cassiop. SP. R.
	-64.52.33,08								-27. 7.29,98	ε Cassiopeiae SP.
	41. 5.16,05	29,950	48,0	48,5	51,03	5,58	10,714	15.55,80	78.37.13,98	⊙.
	40.33.25,02				50,09	5,52			78.37.13,67	⊙.
	31.26.48,24	29,956	49,0	49,4	35,75	3,18		6,31	69.14.22,78	Venus.
	28.16.11,46	30,048	47,8	46,8					65.52.41,85	♃.
	28.16.11,20								65.52.41,59	♃.
	28.16.11,11				31,70	26.33,92		15.24,33	65.52.41,50	♃.
	28.16.11,29								65.52.41,68	♃.
	28.16.10,67								65.52.41,06	♃.
	32.31. 7,24	30,160	48,4	47,7					70. 4.18,83	♃.
	32.31. 7,85								70. 4.19,44	♃.
	32.31. 6,72				37,65	29.46,12		15.11,78	70. 4.18,31	♃.
	32.31. 6,39								70. 4.17,98	♃.
	32.31. 6,89								70. 4.18,48	♃.
	31.29.22,00				36,18				69.17. 6,46	* R. 9 <sup>h</sup> .22 <sup>m</sup> .42 <sup>s</sup> .
	40.24.23,67	30,164	49,3	51,5	49,87	5,50	10,662	15.55,30	77.56.21,02	⊙.
	39.52.34,04				48,94	5,44			77.56.21,12	⊙.
	30.50.43,64	30,150	53,3	54,7	34,76	3,15		5,76	68.38.17,77	Venus.
	37.34.34,91	30,100	51,4	51,2					75. 4. 4,63	♃.
	37.34.34,32								75. 4. 4,04	♃.
	37.34.33,71				45,02	33.24,95		15. 1,37	75. 4. 3,43	♃.
	37.34.34,24								75. 4. 3,96	♃.
	37.34.34,19								75. 4. 3,91	♃.
	42. 4. 5,90			50,7	52,85				79.52. 7,03	ρ Leonis.
	39.44.17,67	29,980	48,0	46,6	48,90	5,42	15.54,80		77.16.14,63	⊙.
	39.12.29,25				47,98	5,36			77.16.14,95	⊙.
	19.58.15,07		47,0	46,2	21,41				57.45.44,76	Castor R.
	19.58.16,12								57.45.45,81	Castor.
	46.33.50,43				1. 2,14				84.22. 0,85	Procyon R.
	46.33.51,74								84.22. 2,16	Procyon.
	31.29.20,50	30,000	44,0	42,1	36,38				69.17. 5,16	* R. 9 <sup>h</sup> .22 <sup>m</sup> .42 <sup>s</sup> .
	43.59.45,74		42,0	40,8	57,50				81.47.51,52	χ Leonis.
	48.27.24,22				1. 7,18				86.15.39,68	τ Leonis.
	48.58. 6,21								86.20.24,86	♃.
	48.58. 6,53								86.20.25,18	♃.
	48.58. 6,37				1. 8,39	40.45,62		14.47,60	86.20.25,02	♃.
	48.58. 6,05								86.20.24,70	♃.
	48.58. 7,56								86.20.26,21	♃.
	49.31.33,28				1. 9,75				87.19.51,31	β Virginis.
	42.34.30,23				54,71				80.22.33,22	ο Virginis.
	38.52.47,07	29,972	47,6	48,0	47,28	5,32	10,694	15.54,50	76.56.31,81	⊙.
	39.24.34,27				48,18	5,38			76.56.30,85	⊙.
	30. 0.57,04	29,954	49,0	49,6	33,76	3,10		6,10	67.48.29,88	Venus.

Coincidence of Micrometer Wire with fixed wire = 10',108, 10',110, 10',113, 10',118, 10',123 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = - 1'',1.

Adopted Zenith Point = 43°.27'.9'',98.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  h. m. s.	Correction for Microm. or Time.  ' "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
Apr. 25	* $\mathcal{R}$ . 10 <sup>h</sup> . 52 <sup>m</sup> . 24 <sup>s</sup> M.	31. 40	1. 19,8	31,7	26,8	30,2	28,8	29,7	11,580	- 30,62	31. 40. 57,16	G.
	(a) Mars S.L. ....	86. 5	4. 50,9	64,9	63,2	65,3	63,4	63,0			86. 10. 1,78	G.
	$\chi$ Leonis. ....	87. 25	1. 46,0	58,4	57,0	57,8	55,8	54,1			87. 26. 54,78	G.
	$\tau$ Leonis. ....	91. 50	4. 26,1	38,1	35,0	35,5	34,8	32,0			91. 54. 33,42	G.
	$\beta$ Virginis M. ....	92. 55	4. 27,2	38,2	35,0	37,3	35,3	32,4	12,488	- 49,57	92. 58. 44,50	G.
	$\gamma$ Ursæ Maj. R. M.	225. 45	4. 27,2	41,3	35,0	36,2	38,5	32,9	9,892	+ 4,61	225. 49. 39,63	G.
	$\gamma$ Ursæ Majoris...	41. 0	4. 34,4	46,9	43,2	43,1	42,0	39,2			41. 4. 41,30	G.
	(b) $\alpha$ Virginis. ....	86. 0	1. 30,3	44,0	39,8	42,2	41,0	39,3		+ 0,11	86. 1. 39,48	G.
	(c) $\eta$ N.L. ....	98. 15	3. 48,2	63,0	59,2	59,2	60,0	54,8		+ 8,00	98. 19. 5,25	G.
	$\eta$ N.L. M. ....	98. 15	3. 48,2	63,0	59,2	59,2	60,0	54,3	9,953	+ 3,28	98. 19. 4,53	G.
	$\eta$ N.L. M. ....	98. 15	3. 48,2	63,0	59,2	59,2	60,0	54,3	9,787	+ 6,81	98. 19. 4,06	G.
	$\eta$ N.L. M. ....	98. 15	3. 48,2	63,0	59,2	59,2	60,0	54,3	9,585	+ 11,13	98. 19. 4,38	G.
	$\eta$ N.L. M. ....	98. 15	3. 48,2	63,0	59,2	59,2	60,0	54,3	9,391	+ 15,28	98. 19. 4,53	G.
	(d) $\alpha$ Cassiop. SP. R. M.	295. 30	4. 24,1	37,0	32,2	33,9	32,4	29,8	16,960	- 2. 22,92	295. 32. 8,48	G.
	$\alpha$ Cassiopeiæ SP...	331. 20	2. 5,4	19,1	16,2	17,8	16,8	16,0			331. 22. 15,13	G.
	$\gamma^1$ Virginis. ....	96. 10	2. 44,0	57,8	54,2	53,2	54,3	51,0			96. 12. 52,32	G.
	Jupiter N.L. ....	98. 35	2. 4,1	18,2	15,2	14,3	15,5	11,2			98. 37. 13,00	G.
	$\psi$ Virginis. ....	104. 15	3. 8,4	21,0	18,0	19,0	17,8	14,1			104. 18. 16,27	G.
	(e) 42 Virginis. ....	86. 55	1. 25,1	37,2	32,8	35,5	34,7	33,8			86. 56. 33,13	G.
	Pallas. ....	75. 0	3. 57,8	68,2	68,0	65,8	67,8	63,3			75. 4. 5,00	G.
	Polaris SP. R. M.	262. 45	1. 21,8	37,3	32,0	34,3	33,8	33,0	10,435	- 6,72	262. 46. 25,26	G.
	Polaris SP. ....	4. 5	2. 48,8	62,8	60,3	58,8	59,8	56,3			4. 7. 57,68	G.
	Ceres. ....	87. 10	3. 1,8	15,9	13,4	12,7	12,5	9,6			87. 13. 10,87	G.
	* $\mathcal{R}$ . 1 <sup>h</sup> . 17 <sup>m</sup> . 16 <sup>s</sup> SP.	332. 10	4. 41,0	53,3	49,0	49,9	51,0	45,2			332. 14. 48,05	G.
	* $\mathcal{R}$ . 1 <sup>h</sup> . 21 <sup>m</sup> . 45 <sup>s</sup> SP.	332. 0	4. 28,8	41,4	37,2	38,2	39,8	34,9			332. 4. 36,55	G.
	$\eta$ Ursæ Maj. R. M.	221. 20	1. 15,5	33,9	25,8	29,5	28,0	27,8	10,398	- 5,94	221. 21. 20,64	G.
	$\eta$ Ursæ Majoris...	45. 30	2. 55,5	68,1	64,9	63,3	65,4	62,0			45. 33. 3,08	G.
	$\eta$ Bootis R. M. ....	190. 25	2. 19,5	36,5	30,2	30,8	31,1	28,1	10,985	- 18,20	190. 27. 11,08	G.
	$\eta$ Bootis. ....	76. 25	2. 3,8	16,0	14,5	12,9	13,4	10,2			76. 27. 11,72	G.
Apr. 26	(f) Venus S.L. ....	73. 10	2. 32,6	44,4	40,5	41,8	44,0	39,2			73. 12. 40,22	G.
	Castor R. M. ....	203. 25	3. 18,4	29,0	24,1	28,2	27,8	25,8	8,758	+ 28,15	203. 28. 53,43	G.
	Castor. ....	63. 25	0. 16,4	30,7	26,0	28,3	28,2	26,0			63. 25. 25,90	G.
	Procyon R. M. ....	176. 50	2. 20,2	33,0	29,0	32,7	32,8	30,0	7,785	+ 48,47	176. 53. 17,90	G.
	Procyon. ....	90. 0	0. 51,8	65,6	62,0	65,1	63,2	60,4			90. 1. 1,27	G.
	Pollux R. M. ....	199. 40	0. 25,7	37,9	32,9	38,2	34,9	36,5	13,456	- 1. 9,90	199. 39. 24,40	G.
	Pollux. ....	67. 10	4. 46,4	59,7	55,8	55,2	60,2	51,0			67. 14. 54,33	G.
	(g) $\eta$ N.L. ....	109. 30	4. 54,9	68,6	63,8	65,8	65,3	59,3		+ 7,42	109. 35. 9,99	G.
Apr. 27	$\eta$ N.L. M. ....	109. 30	4. 54,9	68,6	63,8	65,8	65,3	59,3	9,943	+ 3,36	109. 35. 9,64	G.
	$\eta$ N.L. M. ....	109. 30	4. 54,9	68,6	63,8	65,8	65,3	59,3	9,757	+ 7,30	109. 35. 9,87	G.
	$\eta$ N.L. M. ....	109. 30	4. 54,9	68,6	63,8	65,8	65,3	59,3	9,670	+ 9,20	109. 35. 8,06	G.
	$\eta$ N.L. M. ....	109. 30	4. 54,9	68,6	63,8	65,8	65,3	59,3	9,448	+ 13,87	109. 35. 9,02	G.
	$\eta$ Bootis R. M. ....	190. 25	2. 17,8	32,2	25,9	28,3	27,2	25,2	10,881	- 16,15	190. 27. 9,77	G.
	$\eta$ Bootis. ....	76. 25	2. 2,8	14,1	10,6	12,3	10,3	8,1			76. 27. 9,53	G.
	Arcturus R. M. ....	191. 10	4. 21,4	34,2	28,8	30,8	30,8	27,3	5,528	+ 1. 35,58	191. 16. 4,13	G.
	Arcturus. ....	75. 35	3. 7,0	18,0	15,8	15,7	15,5	13,0			75. 38. 13,92	G.
	$\lambda$ Virginis. ....	108. 15	0. 38,0	51,2	46,5	49,0	47,0	46,4			108. 15. 46,28	G.
	A.S.C. 1668. M. ....	116. 5	1. 16,2	29,2	23,8	27,0	25,0	24,6	9,908	+ 4,42	116. 6. 28,92	G.
	$\rho$ Libræ. ....	110. 20	4. 29,1	41,0	35,4	36,4	37,3	32,4			110. 24. 34,92	G.
	$\beta$ Ursæ Min. R. M.	246. 0	3. 20,5	33,2	28,0	30,3	28,8	27,5	12,940	- 58,87	246. 2. 28,91	G.
	$\beta$ Ursæ Minoris...	20. 50	1. 46,1	56,8	54,0	54,8	54,4	51,9			20. 51. 52,85	G.
	A.S.C. 1703. ....	102. 50	0. 33,4	45,0	40,9	44,9	41,6	41,0			102. 50. 41,08	G.
Apr. 28	Arcturus R. M. ....	191. 15	1. 34,8	46,5	43,3	46,3	44,8	43,1	11,906	- 37,28	191. 16. 5,72	G.
	Arcturus. ....	75. 35	3. 8,0	18,1	15,8	15,3	15,8	13,4			75. 38. 14,15	G.

Coincidences at the five wires and Runs taken April 30, 1<sup>h</sup>. (Temp. 63°).

(a) No correction for runs.

(b) At the 5th wire.

(c) At the five wires.

(d) Unsteady blur.

(e) The same star as that taken on April 6.

(f) Cloudy and very unsatisfactory.

(g) At the five wires; cloudy, and great waving of limb.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.						
			Attach.	Free.												
"	"	Inch.	"	"	"	"	"	"	"	"						
10,47	- 11.46.12,82	29,978	43,0	40,7	12,41	7,06	10,782	6,98	26. 0.43,05	* $\mathcal{R}$ . 10 <sup>h</sup> .52 <sup>m</sup> .24 <sup>s</sup>						
	42.42.51,80				54,95				80.30.40,99	Mars.						
	43.59.44,80				57,47				81.47.50,55	$\chi$ Leonis.						
	48.27.23,44				1. 7,14				86.15.38,86	$\tau$ Leonis.						
	49.31.34,52		41,2	38,7	1.10,01				87.19.52,81	$\beta$ Virginis.						
	- 2.22.29,65				2,47				35.24.36,16	$\gamma$ U. Majoris R.						
	- 2.22.28,68				54,91				35.24.37,13	$\gamma$ Ursæ Majoris.						
	42.34.29,50								80.22.32,69	$\alpha$ Virginis.						
	54.51.55,27				38,4				92.11.10,65	$\delta$ .						
	54.51.54,55								92.11. 9,93	$\delta$ .						
54.51.54,08	1.24,87	44. 1,61	14.43,84	92.11. 9,46	$\delta$ .											
54.51.54,40				92.11. 9,78	$\delta$ .											
54.51.54,55				92.11. 9,93	$\delta$ .											
11,80	- 72. 4.58,50	40,6	37,8	3. 3,15	1,55	8,100	21,01	- 34.20.53,37	$\alpha$ Cassiop. SP. R.							
	- 72. 4.54,85			1.18,60				- 34.20.49,72	$\alpha$ Cassiop. SP.							
	52.45.42,34			1.25,94				90.34. 9,22	$\gamma^1$ Virginis.							
	55.10. 3,02			1.47,09				92.58.56,70	Jupiter N.L.							
	60.51. 6,29			56,80				98.40. 1,66	$\psi$ Virginis.							
	43.29.23,15			36,88				81.17.28,23	42 Virginis.							
	31.36.55,02			49,06				69.24.37,45	Pallas.							
	- 39.19.15,28			57,36				- 1.32.56,06	Polaris SP. R.							
	- 39.19.12,30			2.54,56				- 1.32.53,08	Polaris SP.							
	43.46. 0,89			2.56,23				81.34. 3,02	Ceres.							
11,47	- 71.12.21,93	29,990	40,0	36,9	2.56,23	3,51	10,709	6,31	- 33.28. 8,21	* $\mathcal{R}$ . 1 <sup>h</sup> .17 <sup>m</sup> .16 <sup>s</sup> .						
	- 71.22.33,43				2,20				- 33.38.21,38	* $\mathcal{R}$ . 1 <sup>h</sup> .21 <sup>m</sup> .45 <sup>s</sup> .						
	2. 5.49,34				39,00				39.52.59,82	$\eta$ U. Majoris R.						
	2. 5.53,10								39.53. 3,58	$\eta$ Ursæ Majoris.						
	32.59.58,90								70.47.46,18	$\eta$ Bootis R.						
	33. 0. 1,74								70.47.49,02	$\eta$ Bootis.						
	29.45.30,24				30,060				46,5	48,5	33,60	3,09	10,709	6,31	67.33. 2,72	Venus.
	19.58.16,55				30,070				50,0	51,2	21,25				57.45.46,08	Castor R.
	19.58.15,92														57.45.45,45	Castor.
	46.33.52,08										1. 1,69				84.22. 2,05	Procyon R.
9,58	46.33.51,29								84.22. 1,26	Procyon.						
	23.47.45,58				25,78				61.35.19,64	Pollux R.						
	23.47.44,35								61.35.18,41	Pollux.						
	66. 8. 0,01	30,172	48,2	46,7					103.22.53,96	$\delta$ .						
	66. 7.59,66					103.22.53,61	$\delta$ .									
	66. 7.59,89				2.13,06	49. 9,07	14.41,68	103.22.53,84	$\delta$ .							
	66. 7.58,08							103.22.52,03	$\delta$ .							
	66. 7.59,04							103.22.52,99	$\delta$ .							
	33. 0. 0,21							38,44	70.47.46,93	$\eta$ Bootis R.						
	32.59.59,55								70.47.46,27	$\eta$ Bootis.						
32.11. 5,85	47,4				45,5	37,35	69.58.51,48	Arcturus R.								
32.11. 3,94						2. 5,57	69.58.49,57	Arcturus.								
64.48.36,30						3. 7,87	102.37.50,15	$\lambda$ Virginis.								
72.39.18,64		2.18,70	110.29.34,79	A.S.C. 1668.												
10,88	66.57.24,94								104.46.51,92	$\rho$ Libræ.						
	- 22.35.18,93				24,70				15.11.24,65	$\beta$ Ursæ Min. R.						
	- 22.35.17,13				1.40,03				15.11.26,45	$\beta$ Ursæ Minoris.						
	59.23.31,10								97.12.19,41	A.S.C. 1703.						
	32.11. 4,26	30,226	48,0	46,2	37,36				69.58.49,90	Arcturus R.						
	32.11. 4,17							69.58.49,81	Arcturus.							

Coincidence of Micrometer Wire with fixed Wire = 10', 108, 10', 110, 10', 113, 10', 118, 10', 123, at the five wires.

From April 26 = 10', 103, 10', 104, 10', 107, 10', 111, 10', 113, at the five wires.

One Micrometer Revolution = 20", 873.

Correction for Runs = - 1", 1. From April 26 = - 2", 3.

Adopted Zenith Point = 43°. 27'. 9", 98.

Assumed Co-latitude = 37°. 47'. 8", 28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.	Microscopes.						Micrometer, or Time by Molyneux.	Correction for Microm. or Time.	Concluded reading of Circle.	Observer.
			A	B	C	D	E	F				
			° ' "	° ' "	° ' "	° ' "	° ' "	° ' "				
Apr. 28	λ Virginis.....	108.15	0.37,9	50,2	46,8	49,3	46,4	47,4			108.15.46,27	G.
	(a) ) S.L.....	115.0	3.36,4	47,4	43,2	45,8	44,8	41,7			115.3.49,67	G.
	) S.L. M.....	115.0	3.36,4	47,4	43,2	45,8	44,8	41,7	9,984	+6,74	115.3.48,81	G.
	) S.L. M.....	115.0	3.36,4	47,4	43,2	45,8	44,8	41,7	9,824	+2,51	115.3.48,83	G.
	) S.L. M.....	115.0	3.36,4	47,4	43,2	45,8	44,8	41,7	9,703	+3,37	115.3.48,83	G.
	) S.L. M.....	115.0	3.36,4	47,4	43,2	45,8	44,8	41,7	9,583	+5,90	115.3.48,08	G.
	) S.L. M.....	115.0	3.36,4	47,4	43,2	45,8	44,8	41,7	9,583	+8,52	115.3.47,26	G.
	A.S.C. 1668. M...	116.5	2.20,0	32,1	26,8	30,3	28,9	26,1	12,913	-3,37	116.6.28,60	G.
	ρ Libræ.....	110.20	4.28,4	39,5	34,0	36,4	37,2	31,3	12,913	-6,74	110.24.34,12	G.
	β Ursæ Min. R. M.	246.0	3.16,4	30,0	25,0	27,8	24,5	25,2	12,852	-58,58	246.2.27,26	G.
Apr. 29	β Ursæ Minoris...	20.50	1.44,7	54,9	53,8	53,7	53,3	51,8		-57,29	20.51.51,90	G.
	20 Libræ.....	120.10	4.35,2	49,0	43,5	45,8	46,4	40,4			120.14.43,02	G.
	(b) ☉ N.L. M.....	81.0	3.15,0	28,0	24,4	25,2	28,0	20,0	10,480		81.3.15,39	G.
	☉ S.L.....	81.30	4.55,1	68,7	64,8	64,4	68,4	58,8		-7,78	81.35.2,98	G.
	(c) Venus S.L.....	72.25	5.0,0	13,6	9,0	9,6	14,5	3,9			72.30.8,03	G.
	β Cephei SP. R. M.	281.20	3.21,7	30,1	28,5	30,4	31,8	27,8	14,860	-1.39,20	281.21.48,92	G.
	β Cephei SP.....	345.30	2.21,1	30,0	29,2	30,8	34,0	28,8			345.32.28,78	G.
	Regulus R. M....	183.55	3.11,6	24,9	18,8	22,0	20,4	20,9	4,970	+1.47,24	184.0.6,76	G.
	Regulus.....	82.50	4.1,7	18,1	12,8	13,8	15,9	9,4			82.54.11,63	G.
	☉ Cephei SP. R. M.	285.50	2.24,1	36,0	31,8	33,7	32,0	32,4	13,338	-1.7,44	285.51.24,03	G.
	☉ Cephei SP.....	341.0	2.48,0	60,5	56,0	56,6	57,8	55,2			341.2.55,47	G.
	* R. 10 <sup>h</sup> . 52 <sup>m</sup> . 24 <sup>s</sup> .	31.40	0.49,4	62,8	58,5	59,1	58,9	58,8			31.40.57,83	G.
	Mars S.L.....	86.20	4.42,8	57,8	53,0	54,0	55,2	49,4			86.24.51,67	G.
	Jupiter N.L.....	98.25	2.50,7	63,2	60,2	61,3	61,3	57,2			98.27.58,75	G.
	(d) 42 Virginis.....	86.55	1.26,4	37,8	34,4	36,5	37,4	34,7			86.56.34,42	G.
	Pallas.....	74.25	3.7,9	20,8	17,6	17,3	19,8	16,3			74.28.16,37	G.
	Polaris SP. R. M..	262.45	2.21,1	34,2	29,8	32,7	33,0	31,3	13,208	-1.4,73	262.46.25,42	G.
	Polaris SP.....	4.5	2.46,2	56,7	54,8	54,5	57,0	52,7			4.7.53,43	G.
	Ceres.....	87.15	0.25,9	37,9	35,7	36,5	36,3	35,8			87.15.34,63	G.
	(e) β Ursæ Min. R. M.	246.0	2.18,0	30,2	25,8	28,7	26,8	27,4	10,004	+2,15	246.2.28,12	G.
	β Ursæ Minoris...	20.50	1.43,7	53,5	51,7	52,5	50,8	50,7			20.51.50,35	G.
	20 Libræ.....	120.10	4.43,9	55,9	51,5	52,3	54,0	48,2			120.14.50,60	G.
	* R. 15 <sup>h</sup> . 8 <sup>m</sup> . 38 <sup>s</sup> .	102.50	4.7,0	18,8	16,0	17,3	17,4	12,8			102.54.14,57	G.
	♄ Libræ.....	110.35	0.35,8	47,8	44,5	46,0	46,0	44,6			110.35.44,07	G.
	(f) ) S.L.....	119.15	4.1,8	15,0	10,0	10,8	12,1	7,8			119.19.9,27	G.
	) S.L. M.....	119.15	4.1,8	15,0	10,0	10,8	12,1	7,8	9,985	+2,64	119.19.9,08	G.
	) S.L. M.....	119.15	4.1,8	15,0	10,0	10,8	12,1	7,8	9,840	-2,83	119.19.9,30	G.
	* R. 15 <sup>h</sup> . 20 <sup>m</sup> . 29 <sup>s</sup> .	112.30	0.24,0	37,0	32,8	34,0	34,0	34,7			112.30.32,72	G.
	χ Libræ.....	118.50	3.44,4	57,2	52,3	53,2	54,3	50,2			118.53.51,63	G.
	4 Scorpii.....	121.20	2.46,3	58,9	54,8	56,2	55,1	52,7			121.22.53,78	G.
	δ Scorpii.....	117.45	1.7,5	19,3	16,0	17,7	17,3	15,9			117.46.15,52	G.
	Polaris R. M.....	259.40	1.10,2	17,9	15,9	19,7	16,5	20,4	11,850	-36,37	259.40.40,30	G.
	Polaris.....	7.10	3.34,1	43,1	43,7	40,8	46,1	38,0			7.13.40,68	G.
Apr. 30	(g) ☉ S.L. M.....	81.15	1.22,3	41,8	30,7	39,8	39,0	34,8	10,590	-9,96	81.16.25,26	G.
	Mars S.L.....	86.25	4.3,7	18,2	13,4	15,5	18,8	9,6		+0,60	86.29.12,88	G.
	Jupiter S.L.....	98.25	1.23,0	36,5	32,2	35,8	36,4	32,0			98.26.32,68	G.
	Pallas.....	74.20	0.11,8	24,2	22,9	24,0	28,2	24,4			74.20.22,55	G.
	Polaris SP. R. M..	262.45	2.23,4	34,2	31,7	33,5	36,0	33,7	13,184	-1.4,23	262.46.27,65	G.
	Polaris SP.....	4.5	2.43,4	52,8	52,8	52,0	55,8	49,8			4.7.50,88	G.
	Ceres.....	87.15	1.34,1	46,8	44,3	46,3	48,8	43,8			87.16.43,88	G.
	η Ursæ Maj. R. M.	221.20	1.32,9	46,0	41,0	45,4	45,9	43,8	11,238	-23,61	221.21.18,76	G.
	η Ursæ Majoris...	45.30	2.51,5	53,0	60,4	60,7	64,0	59,0			45.32.57,87	G.
	β Ursæ Min. R. M.	246.0	2.7,6	18,8	16,6	18,5	20,0	17,8	9,589	+10,82	246.2.27,19	G.
	β Ursæ Minoris...	20.50	1.41,5	52,8	51,5	52,4	54,0	50,1			20.51.50,25	G.

(a) At the five wires.

(b) Very badly defined.

(c) Cloudy

(d) About 8, 9 magnitude; probably not 42 Virginis.

(e) Unsatisfactory.

(f) At 3rd, 4th and 5th wires; cloudy and unsatisfactory.

(g) At 5th wire; very cloudy. Correction for change of N.P.D. + 0".44.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
9,58	64.48.36,29	30,226	48,0	46,2	2. 5,61	51. 6,57		14.43,10	102.37.50,18	λ Virginis.
	71.36.39,69		47,4	45,0					108.20.55,54	♄.
	71.36.38,83								108.20.54,68	♄.
	71.36.38,85				2. 57,24				108.20.54,70	♄.
	71.36.38,10								108.20.53,95	♄.
	71.36.37,28	30,136				5,16	10,617	15.53,60	108.20.53,13	♄.
	72.39.18,62				3. 8,40				110.29.35,30	A.S.C. 1668.
	66.57.24,14				2. 19,05				104.46.51,47	ρ Libræ.
	-22.35.17,28				24,77				15.11.26,23	β Ursæ Min. R.
	-22.35.18,08				4. 8,55				15.11.25,43	β Ursæ Minoris.
	76.47.33,04								114.38.49,87	20 Libræ.
8,85	37.36. 5,41	30,110	53,8	54,7	44,79	5,23	10,617	5,35	75.39.46,92	☉.
	38. 7.53,00				45,65				75.39.48,10	☉.
	29. 2.58,05		54,8	56,4	32,18				66.50.30,10	Venus.
	-57.54.38,94		53,5	55,5	1.32,20				-20. 9. 2,86	β Cephei SP. R.
	-57.54.41,20								-20. 9. 5,12	β Cephei SP.
9,20	39.27. 3,22	30,076		55,0	47,73	6,87	10,789	7,12	77.14.59,23	Regulus R.
	39.27. 1,65								77.14.57,66	Regulus.
	-62.24.14,05		52,6	52,6	1.51,10				-24.38.56,87	ι Cephei SP. R.
	-62.24.14,51								-24.38.57,33	ι Cephei SP.
	-11.46.12,15				12,15				26. 0.43,98	*R.10 <sup>h</sup> .52 <sup>m</sup> .24 <sup>s</sup> .
9,43	42.57.41,69	30,088	50,6	48,9	54,27	1,54	8,079	21,17	80.45.30,25	Mars.
	55. 0.48,77				1.23,81				92.49.40,49	Jupiter.
	43.29.24,44				55,72				81.17.28,44	42 Virginis.
	31. 1. 6,39				35,34				68.48.47,39	Pallas.
	-39.19.15,44				48,12				-1.32.55,28	Polaris SP. R.
9,24	-39.19.16,55	30,072			56,34	3,47			-1.32.56,39	Polaris SP.
	43.48.24,65								81.36.25,80	Ceres.
	-22.35.18,14		48,8	47,3	24,53				15.11.25,61	β Ursæ Min. R.
	-22.35.19,63								15.11.24,12	β Ursæ Minoris.
	76.47.40,62				4. 6,14				114.38.55,04	20 Libræ.
10,49	59.27. 4,59	30,058			1.39,56	52.24,83	14.46,01		97.15.52,43	*R.15 <sup>h</sup> .8 <sup>m</sup> .38 <sup>s</sup> .
	67. 8.34,09				2.18,95				104.58. 1,32	♄ Libræ.
	75.51.59,29		48,5	46,9					112.35.46,88	♄.
	75.51.59,10				3.50,15				112.35.46,69	♄.
	75.51.59,32								112.35.46,91	♄.
9,27	69. 3.22,74	30,040			2.32,94	5,19	10,754	6,75	106.53. 3,96	*R.15 <sup>h</sup> .20 <sup>m</sup> .29 <sup>s</sup> .
	75.26.41,65				3.43,55				113.17.33,38	χ Libræ.
	77.55.43,80				4.29,25				115.47.21,33	4 Scorpii.
	74.19. 5,54				3.27,12				112. 9.40,94	δ Scorpii.
	-36.13.30,32		56,0	58,5	42,17				1.32.55,79	Polaris R.
8,32	-36.13.29,30	29,976				2,60	12,151	21,33	1.32.56,81	Polaris.
	37.49.15,28		57,5	62,7	44,28				75.21. 9,35	☉.
	43. 2. 2,90		55,0	58,7	53,56				80.49.51,16	Mars.
	54.59.22,70		55,1	55,2	1.22,32				92.47.30,43	Jupiter.
	30.53.12,57				34,57				68.40.52,82	Pallas.
8,72	-39.19.17,67	29,962			47,31	3,46			-1.32.56,70	Polaris SP. R.
	-39.19.19,10				55,42				-1.32.58,13	Polaris SP.
	43.49.33,90								81.37.34,14	Ceres.
	2. 5.51,22		54,8	54,1	2,12				39.53. 1,62	η Ursæ Maj. R.
	2. 5.47,89								39.52.58,29	η Ursæ Majoris.
8,72	-22.35.17,21	29,940	53,7	52,7	24,15				15.11.26,92	β Ursæ Min. R.
	-22.35.19,73								15.11.24,40	β Ursæ Minoris

Coincidence of Micrometer Wire with fixed Wire = 10<sup>h</sup>,103, 10<sup>h</sup>,104, 10<sup>h</sup>,107, 10<sup>h</sup>,111, 10<sup>h</sup>,113 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = -2'',3.

Adopted Zenith Point = 43°.27'.9'',98.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  h. m. s.	Correction for Microm. or Time.  " "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
Apr. 30	α Cor. Bor. R. M.	198.25	4.20,4	32,9	29,0	31,6	35,0	28,0	8,378	+ 36,09	198.30.52,4	G.
	α Coronæ Borealis.	68.20	4.5,3	17,6	15,5	14,8	21,0	12,2			68.24.14,08	G.
	(a) χ Libræ.....	118.50	3.41,5	54,8	50,7	53,2	56,2	48,4			118.53.50,52	G.
	δ Scorpii.....	117.45	1.7,4	21,0	17,3	19,3	20,8	18,3	14,817 1.4.5 1.4.30	-1.38,31 -0,31 +0,43	117.46.17,25	G.
	(b) Polaris R. M.....	259.40	2.13,9	23,0	20,2	23,1	22,4	22,8			259.40.42,10	G.
	Polaris.....	7.10	3.33,5	42,3	41,7	40,4	45,0	38,8			7.13.40,43	G.
May 1	⊙ N.L. M.....	80.25	1.22,7	38,2	30,9	36,4	35,8	32,3	10,738	-13,17	80.26.19,43	G.
	⊙ S.L.....	80.55	2.54,1	70,0	63,3	66,6	67,4	62,2			80.58.3,70	G.
	(c) Venus S.L.....	72.0	4.48,0	63,0	57,6	59,8	62,7	53,1			72.4.56,98	G.
	ε Bootis R. M.....	198.55	4.36,5	46,8	41,3	45,2	44,6	41,3	9,673	+9,06	198.59.51,31	G.
	ε Bootis.....	67.50	4.20,8	30,0	23,2	28,3	31,8	25,9			67.54.26,83	G.
	β Ursæ Min. R. M.	246.0	3.17,1	26,8	22,7	26,1	25,3	24,4	12,719	-54,52	246.2.28,95	G.
May 2	β Ursæ Minoris...	20.50	1.43,8	52,0	49,4	51,3	51,8	48,7			20.51.49,37	G.
	⊙ S.L. M.....	80.40	0.20,6	33,5	27,2	33,5	31,3	31,0	11,664	-32,50	80.39.56,98	G.
	(d) ⊙ N.L.....	80.5	3.2,8	16,3	11,8	14,4	15,4	10,4			80.8.11,60	G.
	Venus S.L.....	71.50	3.11,7	11,5	10,8	12,0	11,6	9,0			71.53.10,80	G.
	γ Ursæ Maj. R. M.	225.45	4.20,3	17,0	20,2	16,8	17,8	16,4	9,307	+16,70	225.49.34,38	G.
	γ Ursæ Majoris...	41.0	4.33,5	28,9	30,8	30,5	28,0	30,0			41.4.29,87	G.
May 3	⊙ N.L. M.....	79.45	4.48,9	48,8	47,9	49,3	48,0	46,0	9,028	+22,52	79.50.10,22	G.
	⊙ S.L.....	80.20	1.56,3	56,0	56,5	57,2	54,3	55,0			80.21.55,70	G.
	Venus S.L.....	71.40	2.12,8	11,8	11,4	12,7	10,3	10,2			71.42.11,33	G.
	Mars N.L.....	86.40	3.12,5	9,2	10,5	11,0	10,4	9,5			86.43.10,22	G.
	Jupiter N.L.....	98.15	4.30,5	25,5	26,8	27,0	30,0	26,8			98.19.27,35	G.
	(e) 42 Virginis.....	86.55	1.29,0	24,6	26,0	27,2	25,8	27,4			86.56.26,53	G.
	Pallas.....	73.55	3.57,5	53,5	55,3	54,3	55,9	54,0			73.58.54,72	G.
	Ceres.....	87.20	1.9,8	5,4	8,9	9,1	6,0	8,9			87.21.7,92	G.
	* R. 1 <sup>h</sup> . 17 <sup>m</sup> . 16 <sup>s</sup> . SP.	332.10	4.33,5	27,8	29,4	31,3	31,6	30,0	13,420	-1.9,15	332.14.30,18	G.
	η Ursæ Maj. R. M.	221.20	2.22,2	18,4	17,8	20,4	17,4	20,5			221.21.10,08	G.
	η Ursæ Majoris...	45.30	2.54,6	49,8	50,5	49,5	49,0	51,4			45.32.50,53	G.
	η Bootis R. M.....	190.25	2.34,4	31,8	31,8	34,0	32,3	34,3	11,684	-32,92	190.26.59,95	G.
	η Bootis.....	76.25	1.64,0	58,4	62,3	61,8	61,5	61,7			76.27.1,43	G.
	A.S.C. 1668. M...	116.5	2.5,3	0,5	2,9	3,8	0,7	3,8	11,926	-37,97	116.6.24,68	G.
	ρ Libræ.....	110.20	4.33,6	29,8	30,2	29,9	29,2	29,3			110.24.29,92	G.
	A.S.C. 1703.....	102.50	0.37,9	33,3	35,0	36,8	33,8	37,2			102.50.35,62	G.
	* R. 15 <sup>h</sup> . 8 <sup>m</sup> . 38 <sup>s</sup> ..	102.50	4.11,8	6,4	8,3	7,8	7,0	6,0			102.54.7,50	G.
	♄ Libræ.....	110.35	0.41,3	37,3	38,4	39,6	37,6	40,3			110.35.39,02	G.
	* R. 15 <sup>h</sup> . 20 <sup>m</sup> . 29 <sup>s</sup> ..	112.30	0.27,0	24,0	25,8	27,8	23,3	29,0			112.30.26,12	G.
	α Serpentis R. M.	178.10	0.21,3	18,0	20,2	21,5	20,9	23,9	8,047	+43,00	178.11.3,93	G.
	α Serpentis.....	88.40	2.62,5	59,0	60,6	60,8	60,5	61,1			88.43.0,47	G.
	(f) 4 Scorpii M.....	121.20	2.7,0	4,4	4,8	5,8	1,6	4,5			121.22.47,48	G.
	ζ Ursæ Min. R. M.	249.30	2.11,8	8,3	8,4	9,3	9,3	11,4	14,638	-1.34,58	249.30.34,97	G.
	ζ Ursæ Minoris...	17.20	3.31,3	28,0	28,0	27,0	29,0	27,9			17.23.28,20	G.
	η Herculis.....	89.45	1.60,5	56,0	60,0	58,8	56,9	59,0			89.46.58,35	G.
	(g) Saturn N.L.....	115.25	2.13,6	11,0	11,2	11,5	10,8	10,8	9,248	+17,87	115.27.11,28	G.
May 4	⊙ N.L. M.....	79.30	2.18,8	20,0	18,1	20,4	19,8	17,6			79.32.36,77	G.
	⊙ S.L.....	80.0	4.18,3	18,2	18,3	18,1	19,0	14,9			80.4.17,40	G.
	Venus S.L.....	71.30	1.53,2	52,7	52,8	54,7	54,1	53,2			71.31.53,27	G.
May 6	⊙ S.L. M.....	79.30	0.28,5	26,4	28,8	29,3	27,0	29,8	11,900	-37,49	79.29.50,76	G.
	⊙ N.L.....	78.55	3.10,0	7,2	10,0	10,8	8,0	7,3			78.58.8,58	G.
	Saturn S.L.....	115.25	0.37,3	33,1	36,5	35,7	32,1	36,1			115.25.35,08	G.

Coincidences at the five wires and Runs taken May 7, 1<sup>h</sup>. (Temp. 60°).

(a) Faint. (b) Extremely faint. (c) Faint from clouds. (d) After this observation the microscopes were adjusted. (e) The night was clear yet this star appeared but of the 10th magnitude; most probably it is not 42 Virginis. (f) Bisected on the micrometer wire by mistake. (g) Unsteady; the ring is in such a position that the S.L. of the planet is not visible.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
9,66	24.57.47,4 24.57.41,0 75.26.40,54 74.19.7,27	29,934	52,4	51,6	27,06 3.40,24 3.24,16				62.44.40,08 62.44.39,44 113.17.29,06 112.9.39,71	$\alpha$ Cor. Bor. R. $\alpha$ Coronæ Bor. $\chi$ Libræ. $\delta$ Scorpii.
11,27	-36.13.32,12 -36.13.29,55	29,900	55,2	58,1	41,99				1.32.54,17 1.32.56,74	Polaris R. Polaris.
9,07	36.59.9,45 37.30.53,72 28.37.47,00 24.27.18,67 24.27.16,85	29,888 29,860 29,842	56,5 58,2 55,2	60,2 63,4 54,4	42,97 43,80 30,92 26,22	5,09 5,15 3,05	10,745	15.53,10 6,68	75.2.48,71 75.2.47,55 66.25.16,47 62.14.53,17 62.14.51,35	$\odot$ . $\odot$ . Venus. $\epsilon$ Bootis R. $\epsilon$ Bootis.
9,16	-22.35.18,97 -22.35.20,61				23,99				15.11.25,32 15.11.23,68	$\beta$ Ursæ Min. R. $\beta$ Ursæ Minoris.
62,13	37.12.47,00 36.41.1,62 28.26.9,83 -2.22.33,41 -2.22.31,10	29,870 29,880 29,874	57,5 62,3 53,4	61,4 62,5 51,4	43,19 42,37 30,75 2,40	5,11 5,05 3,04	10,780	15.52,90 7,04	74.44.40,46 74.44.40,12 66.13.38,78 35.24.32,47 35.24.34,78	$\odot$ . $\odot$ . Venus. $\gamma$ Ursæ Maj. R. $\gamma$ Ursæ Majoris.
60,31	36.23.9,25 36.54.54,73 28.15.10,36 43.16.9,25 54.52.26,38 43.29.25,56 30.31.53,75 43.54.6,95 -71.12.30,79 2.5.50,89 2.5.49,56	29,880 29,862 29,830	54,4 58,2 56,8 54,5	56,0 59,4 55,5 53,3	42,38 43,21 30,69 54,09 1.21,93 54,75 34,06 55,54 2.48,41	5,01 5,08 3,04 6,69 1,53	10,800 9,504 8,128	15.52,60 7,25 6,29 20,66	74.26.47,50 74.26.48,54 66.2.39,04 81.4.11,22 92.41.15,72 81.17.28,59 68.19.33,57 81.42.7,35 -33.28.10,92 39.53.1,29 39.52.59,96 70.47.46,88 70.47.46,32 110.29.36,13 104.46.53,17 97.12.20,98 97.15.53,09 104.58.3,50 106.53.4,28 83.4.4,07 83.4.6,53 115.47.20,69 11.43.5,78 11.43.7,01 84.8.6,66 109.50.23,11	$\odot$ . $\odot$ . Venus. Mars. Jupiter. 42 Virginis. Pallas. Ceres. * $\mathcal{R}$ .1 <sup>h</sup> .17 <sup>m</sup> .16 <sup>s</sup> . $\eta$ Ursæ Maj. R. $\eta$ Ursæ Majoris. $\eta$ Bootis R. $\eta$ Bootis. A.S.C. 1668. $\rho$ Libræ. A.S.C. 1703. * $\mathcal{R}$ .15 <sup>h</sup> .8 <sup>m</sup> .38 <sup>s</sup> . $\sigma^1$ Libræ. * $\mathcal{R}$ .15 <sup>h</sup> .20 <sup>m</sup> .29 <sup>s</sup> . $\alpha$ Serpentis R. $\alpha$ Serpentis. 4 Scorpii. $\zeta$ Ursæ Min. R. $\zeta$ Ursæ Minoris. $n$ Herculis. Saturn.
60,69	33.0.1,02 33.0.0,46 72.39.23,71 66.57.28,95 59.23.34,65 59.27.6,53 67.8.38,05 69.3.25,15				37,58 3.4,14 2.15,94 1.38,05 1.38,28 2.17,17 2.30,85					
62,20	45.15.57,04 45.15.59,50 77.55.46,51 -26.3.34,00 -26.3.32,77 46.19.57,38 72.0.10,31	29,812	51,4	48,7	58,75 4.25,90 28,50					
61,58		29,800	50,0	48,3	1.1,00 2.57,51	0,89	9,350	7,90		
	36.5.35,80 36.37.16,43 28.4.52,30	29,716 29,670	58,6 63,2	60,8 63,4	41,30 42,11 30,03	4,98 5,04 3,04	10,747	15.52,40 6,73	74.9.12,80 74.9.9,38 65.52.20,84	$\odot$ . $\odot$ . Venus.
	36.2.49,79 35.31.7,61 71.58.34,11	29,918 29,994	58,4 45,8	58,5 44,2	41,70 40,90 2.59,91	4,97 4,91 0,89	10,904	15.51,90 8,35	73.34.42,90 73.34.43,78 109.48.33,06	$\odot$ . $\odot$ . Saturn.

Coincidence of Micrometer Wire with fixed Wire = 10',107 at middle Wire. From May 4 = 10',103, 10',103, 10',104, 10',110, 10',112 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = -2'',3. From Venus May 2 = -2'',8.

Adopted Zenith Point = 43°.27'.9'',98. From Venus May 2 = 43°.27'.0'',97.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  " "	Microscopes.						Micrometer, or Time by Molyneux.	Correction for Microm. or Time.	Concluded reading of Circle. " "	Observer.
			A	B	C	D	E	F				
			" "	" "	" "	" "	" "	" "				
May 6	(a) N.L. ....	112.10	3.48,2	46,0	48,2	47,1	46,5	44,5	10,250	-8,26	112.13.38,14	G.
	» N.L. M. ....	112.10	3.48,2	46,0	48,2	47,1	46,5	44,5		-3,07	112.13.39,20	G.
	» N.L. M. ....	112.10	3.48,2	46,0	48,2	47,1	46,5	44,5		-4,13	112.13.39,12	G.
	» N.L. M. ....	112.10	3.48,2	46,0	48,2	47,1	46,5	44,5		-7,28	112.13.38,01	G.
	» N.L. M. ....	112.10	3.48,2	46,0	48,2	47,1	46,5	44,5		-12,52	112.13.35,72	G.
May 7	☉ N.L. M. ....	78.40	1.38,3	38,6	39,7	41,4	38,0	38,0	11,008	-18,87	78.41.19,98	G.
	☉ S.L. ....	79.10	3.3,0	1,9	4,0	3,6	2,2	0,0			79.13.2,17	G.
	Capella R. M. ....	217.0	4.12,8	9,5	11,7	11,0	10,3	7,2		-8,43	217.4.1,60	G.
	Capella. ....	49.45	4.60,0	60,0	59,2	60,0	60,4	55,9			49.49.58,78	G.
	Venus S.L. ....	71.0	4.59,8	59,2	58,8	59,7	54,4				71.4.58,05	G.
	Mars N.L. ....	87.5	0.22,0	18,5	20,8	16,3	21,3		10,508		87.5.19,92	G.
	Jupiter N.L. ....	98.10	1.57,0	54,2	55,3	53,9	49,4	54,2			98.11.53,82	G.
	Pallas. ....	73.35	0.55,9	53,1	55,6	53,4	49,4	54,0			73.35.53,48	G.
	(b) Ceres. ....	87.25	4.62,0	58,0	63,8	61,7	56,5	62,8			87.30.0,80	G.
	η Ursæ Maj. R. M. ....	221.20	1.33,7	31,1	32,2	31,0	28,4	32,2	10,965	-17,97	221.21.13,33	G.
	η Ursæ Majoris ...	45.30	2.55,1	49,8	52,8	49,5	46,3	51,9			45.32.50,63	G.
	η Bootis R. M. ....	190.25	2.29,8	27,4	29,2	27,8	25,9	28,5		-25,17	190.27.2,70	G.
	η Bootis. ....	76.25	1.63,4	59,5	62,4	60,3	57,3	60,0			76.27.0,30	G.
	(c) β Ursæ Min. R. M. ....	246.0	2.25,1	22,2	25,0	22,8	19,1	23,0		+1,12	246.2.23,77	G.
May 8	β Ursæ Minoris ...	20.50	1.45,0	40,5	43,5	42,8	40,8	44,0	10,050		20.51.42,60	G.
	☉ S.L. M. ....	78.55	1.24,2	25,4	25,2	26,7	26,2	24,4		+3,63	78.56.28,85	G.
	☉ N.L. ....	78.20	4.46,0	47,0	47,0	46,5	48,4	43,4			78.24.45,93	G.
	Capella R. M. ....	217.0	4.19,6	16,8	17,0	17,6	17,2	14,9		-15,65	217.4.1,13	G.
	Capella. ....	49.45	4.60,4	60,9	60,0	62,0	56,4				49.49.59,48	G.
May 10	Mars S.L. ....	87.10	1.38,8	34,4	37,3	38,5	36,4	39,4	9,930		87.11.37,32	G.
May 11	Mars N.L. ....	87.30	0.49,8	47,0	53,0	51,0	46,3	50,4	10,854		87.24.21,07	G.
											87.30.49,52	G.
May 12	Polaris R. M. ....	259.40	1.28,3	26,2	27,6	29,8	27,2	31,0	12,988	-1.0,20	259.40.28,02	G.
	Polaris. ....	7.10	3.37,0	33,9	38,0	35,8	36,7	35,2			7.13.35,77	G.
May 14	(d) ☉ S.L. M. ....	77.20	3.22,0	22,6	23,7	21,4	22,2	20,8	10,281	-3,70	77.23.18,10	G.
	☉ N.L. ....	76.50	1.39,0	36,7	39,8	37,1	37,2	38,1			76.51.37,83	G.
	Venus S.L. ....	70.25	1.27,0	24,9	28,0	25,8	25,6	27,3			70.26.26,30	G.
	(e) Saturn S.L. ....	115.20	0.27,8	28,0	30,8	30,6	27,4	30,4		-0,20	115.20.28,92	G.
	ε Ursæ Min. R. M. ....	253.30	1.21,8	20,4	23,3	22,8	18,3	23,8	11,890	-37,28	253.30.44,34	G.
	ε Ursæ Minoris ...	13.20	3.20,8	19,8	21,7	19,8	18,8	19,4			13.23.19,73	G.
	α Herculis R. M. ....	185.45	4.20,4	21,9	22,0	21,8	20,3	20,8		+1,40	185.49.22,20	G.
	α Herculis. ....	81.0	4.38,8	37,7	42,0	36,2	38,0	37,7			81.4.37,97	G.
May 15	☉ N.L. M. ....	76.35	2.23,6	23,4	26,3	24,7	22,4	23,3	10,786	-14,23	76.37.9,50	G.
	☉ S.L. ....	77.5	3.48,4	46,0	50,0	48,0	48,6	45,5			77.8.47,40	G.
May 16	Saturn S.L. ....	115.15	4.3,9	5,7	8,0	5,3	5,3	3,8			115.19.4,95	G.
May 17	☉ N.L. M. ....	76.5	4.16,0	18,1	18,5	18,1	18,2	14,9	10,433	-6,87	76.9.9,93	G.
	☉ S.L. ....	76.40	0.46,0	47,5	48,0	49,2	47,7	47,1			76.40.47,48	G.
	Capella R. M. ....	217.0	4.22,2	20,0	20,8	20,4	22,3	18,8		-20,95	217.3.59,30	G.
	Capella. ....	49.45	4.61,5	62,2	62,8	60,8	64,7	58,3			49.50.1,13	G.
	Venus S.L. ....	70.15	5.26,2	27,1	27,0	25,5	29,8	24,3			70.20.26,02	G.

Runs taken May 28, 1½<sup>h</sup>. (Temp. 57°.)

(a) At the five wires; faint. (b) No correction for runs.  
(c) Too near the fixed wire for satisfactory bisection  
with micrometer wire.

(d) Cloudy.  
(e) At the 5th wire; cloudy. Correction for change  
of N.P.D. = +0",02.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
60,19	68.46.37,17	30,000	47,5	45,3	2.30,93	54.6,98		15.52,13	105.58.1,53	♃.
	68.46.38,23								105.58.2,59	♃.
	68.46.38,15								105.58.2,51	♃.
	68.46.37,04								105.58.1,40	♃.
	68.46.34,75								105.57.59,11	♃.
	35.14.19,01	29,988	57,2	58,0	40,62	4,87	10,750	15.51,70	73.17.54,74	☉.
	35.46.1,20	29,976	59,4	60,2	41,42	4,93			73.17.54,27	☉.
	6.22.59,37				6,41				44.10.14,06	Capella R.
	6.22.57,81	29,950	52,8	50,5	29,96	3,03			44.10.12,50	Capella.
	27.37.57,08				55,57	6,53			65.25.25,54	Venus.
	43.38.18,95	29,940	48,3	45,5	1.23,17	1,51			81.26.22,05	Mars.
	54.44.52,85				34,21	2,43			92.33.43,79	Jupiter.
	30.8.52,51	29,928	47,0	45,2	56,93	3,38			67.56.32,57	Pallas.
	44.2.59,83				2,16				81.51.1,66	Ceres.
	2.5.47,64	29,910	44,8	42,0	38,25				39.52.58,08	η Ursæ Maj. R.
61,98	2.5.49,66				24,66				39.53.0,10	η Ursæ Majoris.
	32.59.58,27	29,910	44,8	42,0			10,692	6,14	70.47.44,80	η Bootis R.
61,50	32.59.59,33								70.47.45,86	η Bootis.
63,19	-22.35.22,80	29,850	61,0	62,0			10,690	6,12	15.11.20,82	β Ursæ Min. R.
	-22.35.18,37								15.11.25,25	β Ursæ Minoris.
60,31	35.29.27,88	29,850	61,0	62,0	40,48	4,90	10,692	6,14	73.1.20,24	☉.
	34.57.44,96	29,828	63,6	64,5	39,70	4,84			73.1.19,60	☉.
	6.22.59,84				6,32				44.10.14,44	Capella R.
	6.22.58,51	29,800	56,7	53,7	55,13	6,49			44.10.13,11	Capella.
	43.44.36,35								81.32.27,13	Mars.
61,90	43.57.20,10	29,972	46,3	43,8	57,01	6,43	9,547	5,82	81.45.12,84	Mars.
	44.3.48,55	30,010	45,0	43,7	57,30	6,38			81.51.53,57	Mars.
	-36.13.27,05	29,800	47,0	48,0	42,71				1.32.58,52	Polaris R.
	-36.13.25,20								1.33.0,37	Polaris.
	33.56.17,13	29,446	44,7	43,2	39,16	4,70	10,855	15.50,20	71.28.9,67	☉.
62,04	33.24.36,86	29,408	44,7	42,8	38,39	4,64			71.28.9,09	☉.
	26.59.25,33				29,63	3,07			64.46.52,33	Venus.
	71.53.27,95	29,340	40,6	37,8	2.57,51	0,90			109.43.22,39	Saturn.
	-30.3.43,37	29,330	39,7	36,8	34,01				7.42.50,90	ε Ursæ Min. R.
60,09	-30.3.41,24				45,28		11,113	10,45	7.42.53,03	ε Ursæ Minoris.
	37.37.38,77	29,296	43,7	43,0					75.25.32,33	α Herculis R.
	37.37.37,00								75.25.30,56	α Herculis.
	33.10.8,53	29,744	41,5	39,3	37,86	4,61			71.13.40,06	☉.
	33.41.46,43				38,62	4,67			71.13.38,66	☉.
60,22	71.52.3,98	29,948	51,6	52,6	2.59,14	0,90	10,782	15.49,60	109.42.1,06	Saturn.
	32.42.8,96	29,948	53,2	54,3	37,28	4,55			70.45.39,57	☉.
	33.13.46,51				38,03	4,61			70.45.38,61	☉.
	6.23.1,67	29,948	53,2	54,3	6,48				44.10.16,43	Capella R.
	6.23.0,16				29,35	3,11			44.10.14,92	Capella.
	26.53.25,05								64.40.52,49	Venus.

Coincidence of Micrometer Wire with fixed Wire = 10', 104, at the middle wire.

One Micrometer Revolution = 20'', 873.

Correction for Runs = -2'', 8. From May 17 = -3'', 5.

Adopted Zenith Point = 43°. 27'. 0'', 97.

Assumed Co-latitude 37°. 47'. 8'', 28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  r. h. m. s.	Correction for Microm. or Time.  ' "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
May 17	(a) N.L. M.....	70.25	2.47,4	49,2	49,7	48,8	49,8	46,7	10,984	-18,39 +4,98	70.27.34,86	G.
	» N.L. M.....	70.25	2.47,4	49,2	49,7	48,8	49,8	46,7	10,863	-15,86 +2,49	70.27.34,90	G.
	» N.L. M.....	70.25	2.47,4	49,2	49,7	48,8	49,8	46,7	10,811	-14,76	70.27.33,51	G.
	» N.L. M.....	70.25	2.47,4	49,2	49,7	48,8	49,8	46,7	10,680	-11,90 -2,49	70.27.33,88	G.
	» N.L. M.....	70.25	2.47,4	49,2	49,7	48,8	49,8	46,7	10,580	-9,77 -4,98	70.27.33,52	G.
	Mars N.L.....	88.10	4.49,0	51,0	51,0	51,5	53,3	47,7			88.14.50,02	G.
	Jupiter N.L.....	97.55	2.24,4	23,8	24,3	24,7	25,2	24,9			97.57.24,27	G.
	Pallas.....	73.0	3.26,8	23,9	27,0	25,0	28,8	25,9			73.3.25,83	G.
	» Herculis M.....	89.45	3.33,0	30,4	33,5	31,4	34,4	33,5	14,798	-1.37,97	89.46.54,31	G.
	Saturn N.L.....	115.15	3.6,1	6,0	8,0	5,9	6,6	5,8			115.18.6,03	G.
	A.S.C. 552. SP.) R. M.....	285.10	2.22,4	20,3	22,6	22,2	24,1	25,2	20,878	-3.44,88	285.8.37,64	G.
	A.S.C. 552. SP....	341.45	0.27,4	23,2	25,8	27,2	26,8	29,8			341.45.26,65	G.
	» Ophiuchi.....	85.10	3.6,6	6,2	8,8	5,2	8,0	5,0			85.13.6,27	G.
	» Ursæ Min. R. M.	253.30	1.24,0	22,8	25,3	25,3	26,2	27,5	12,031	-40,23	253.30.44,79	G.
	» Ursæ Minoris....	13.20	3.19,2	17,0	18,0	16,9	19,2	17,8			13.23.17,63	G.
	A.S.C. 1972.....	127.50	2.59,3	59,0	59,8	57,5	58,9	57,9			127.52.58,38	G.
	* R. 17 <sup>b</sup> . 12 <sup>m</sup> . 30 <sup>s</sup> .	66.40	0.1,4	0,0	2,8	0,0	1,8	2,2			66.40.1,37	G.
	33 Scorpil.....	119.40	1.25,2	24,5	25,6	25,2	26,7	26,4			119.41.25,43	G.
	* R. 17 <sup>b</sup> . 18 <sup>m</sup> . 41 <sup>s</sup> .	62.50	0.40,0	37,0	40,7	38,5	40,3	42,8			62.50.39,80	G.
	* R. 17 <sup>h</sup> . 26 <sup>m</sup> . 7 <sup>s</sup> .	60.40	3.20,7	18,0	22,0	17,8	21,4	20,3			60.43.19,65	G.
	(b) 79 Herculis.....	71.10	4.60,4	57,3	62,6	58,9	60,3	62,5			71.15.0,33	G.
	Polaris R. M.....	259.40	1.18,0	16,4	17,4	18,3	16,4	20,0	12,478	-49,55	259.40.28,05	G.
	Polaris.....	7.10	3.37,2	35,0	38,5	35,9	38,9	35,8			7.13.36,47	G.
	Mercury, center...	86.10	1.32,6	33,1	32,0	35,8	32,8	33,7			86.11.33,15	G.
May 18	» S.L. M.....	76.25	2.24,6	26,0	24,8	26,7	25,7	25,7	10,464	-7,51	76.27.17,79	G.
	» N.L.....	75.55	0.37,0	38,4	38,0	40,2	38,2	38,9			75.55.38,38	G.
	(b) Venus S.L.....	70.15	4.52,8	52,0	55,7	54,1	53,2	54,4			70.19.53,70	G.
May 20	Ceres.....	88.15	4.42,1	43,1	43,3	43,3	46,8	41,8			88.19.42,85	G.
	Spica R. M.....	160.50	4.21,8	23,5	22,0	22,5	26,2	23,1	3,750	+2.12,73	160.56.35,40	G.
	Spica.....	105.55	2.25,8	26,3	25,2	26,1	29,0	26,3			105.57.26,17	G.
May 21	(c) » N.L.....	90.30	4.33,5	32,0	32,2	31,8	33,7	30,4		+8,04	90.34.39,77	G.
	» N.L. M.....	90.30	4.33,5	32,0	32,2	31,8	33,7	30,4	9,930	+3,68 +4,02	90.34.39,43	G.
	» N.L. M.....	90.30	4.33,5	32,0	32,2	31,8	33,7	30,4	9,750	+7,49	90.34.39,22	G.
	» N.L. M.....	90.30	4.33,5	32,0	32,2	31,8	33,7	30,4	9,578	+11,24 -4,02	90.34.38,95	G.
	» N.L. M.....	90.30	4.33,5	32,0	32,2	31,8	33,7	30,4	9,373	+15,54 -8,04	90.34.39,23	G.
	» Leonis.....	95.30	4.57,8	56,2	57,9	57,3	59,7	54,4			95.34.56,65	G.
	» Leonis R. M....	186.40	2.22,8	23,0	21,8	25,3	23,5	23,2	8,098	+41,98	186.43.4,96	G.
	» Leonis.....	80.10	0.57,2	55,0	58,3	58,2	57,0	57,0			80.10.57,00	G.
	» Ursæ Maj. R. M.	225.45	4.28,4	25,9	23,0	25,4	27,2	24,7	9,571	+11,24	225.49.36,49	G.
	» Ursæ Majoris...	41.0	4.28,7	26,3	26,8	28,2	28,1	25,0			41.4.26,67	G.
	Jupiter N.L.....	97.50	3.31,5	30,7	31,8	32,8	31,7	31,1			97.53.31,18	G.
	Pallas.....	72.55	4.25,6	23,0	25,8	24,3	24,8	23,7			72.59.24,02	G.
	Ceres.....	88.20	4.43,0	45,2	45,3	45,8	44,1	43,1			88.24.43,87	G.
	Polaris SP. R. M.	262.45	1.35,8	34,9	35,3	38,2	35,2	38,3	10,751	-13,39	262.46.22,71	G.
	Polaris SP.....	4.5	2.38,4	36,8	38,4	38,8	38,3	38,4			4.7.37,88	G.
	» Ursæ Min. R. M.	249.30	1.22,3	19,6	20,1	22,8	18,8	25,1	12,043	-40,37	249.30.40,93	G.
	» Ursæ Minoris...	17.20	3.24,8	24,5	23,5	22,7	21,7	23,2			17.23.23,00	G.
	Saturn N.L.....	115.15	0.29,8	29,1	29,3	31,2	29,8	32,2			115.15.30,18	G.
May 22	Jupiter S.L.....	97.50	3.27,9	24,0	26,3	24,5	22,2	24,1			97.53.24,43	G.

Coincidences at the five wires taken May 28, 2<sup>h</sup>.(a) At the five wires; faint.  
(b) No correction for runs.

(c) At the five wires; good.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	° ' "	Inch.	°	°	' "	' "	"	' "	° ' "	
	27. 0. 33,89	29,950	53,8	54,2					64. 37. 55,76	♃.
	27. 0. 33,93								64. 37. 55,80	♃.
	27. 0. 32,54				29,51	25. 59,30		15. 43,28	64. 37. 54,41	♃.
	27. 0. 32,91								64. 37. 54,78	♃.
	27. 0. 32,55								64. 37. 54,42	♃.
	44. 47. 49,05	29,974	52,7	51,4	57,80	6,17	9,624	10,02	82. 35. 58,98	Mars.
	54. 30. 23,30	29,992	48,4	47,0	1. 22,32	1,48	8,180	20,08	92. 19. 12,50	Jupiter.
	29. 36. 24,86				33,42	2,24			67. 24. 4,32	Pallas.
	46. 19. 53,34	30,016	43,4	41,6	1. 2,30				84. 8. 3,92	η Herculis.
	71. 51. 5,06				2. 59,72	0,90	9,274	8,67	109. 41. 20,83	Saturn.
62,15	- 61. 41. 36,67				1. 50,11				- 23. 56. 18,50	A.S.C. 552. SP. R.
	- 61. 41. 34,32								- 23. 56. 16,15	A.S.C. 552. SP.
	41. 46. 5,30				53,13				79. 34. 6,71	ι Ophiuchi.
61,21	- 30. 3. 43,82		43,2	40,5	34,53				7. 42. 49,93	ε Ursæ Min. R.
	- 30. 3. 43,34								7. 42. 50,41	ε Ursæ Minoris.
	84. 25. 57,41				9. 15,38				122. 22. 21,07	A.S.C. 1972.
	23. 13. 0,40				25,59				61. 0. 34,27	* R. 17 <sup>h</sup> . 12 <sup>m</sup> . 30 <sup>s</sup>
	76. 14. 24,46				3. 59,19				114. 5. 31,93	33 Scorpii.
	19. 23. 38,83				21,01				57. 11. 8,12	* R. 17 <sup>h</sup> . 18 <sup>m</sup> . 41 <sup>s</sup>
	17. 16. 18,68				18,56				55. 3. 45,52	* R. 17 <sup>h</sup> . 26 <sup>m</sup> . 7 <sup>s</sup>
	27. 47. 59,36				31,46				65. 35. 39,10	79 Herculis.
62,26	- 36. 13. 27,08	30,000	47,5	50,6					1. 32. 58,43	Polaris R.
	- 36. 13. 24,50				42,77				1. 33. 1,01	Polaris.
	42. 44. 32,18		55,8	56,4	53,30	8,14			80. 32. 25,62	Mercury.
	33. 0. 16,82	30,002	58,0	58,6	37,32	4,59		15. 49,50	70. 32. 8,33	☾.
	32. 28. 37,41				36,58	4,52			70. 32. 7,25	☾.
	26. 52. 52,73	29,980	59,5	59,7	29,05	3,13	10,860	7,89	64. 40. 19,04	Venus.
	44. 52. 41,88	30,172	57,4	57,0	57,68	3,22			82. 40. 44,62	Ceres.
60,79	62. 30. 25,57				1. 50,95				100. 19. 24,80	Spica R.
	62. 30. 25,20								100. 19. 24,43	Spica.
	47. 7. 38,80	29,994	56,4	54,7					84. 30. 51,13	♃.
	47. 7. 38,46								84. 30. 50,79	♃.
	47. 7. 38,25				1. 2,31	39. 52,02		14. 53,76	84. 30. 50,58	♃.
	47. 7. 37,98								84. 30. 50,31	♃.
	47. 7. 38,26								84. 30. 50,59	♃.
	52. 7. 55,68	29,982	55,7	54,2	1. 14,39				89. 56. 18,35	ν Leonis.
60,98	36. 43. 56,01				43,23				74. 31. 47,52	β Leonis R.
	36. 43. 56,03								74. 31. 47,54	β Leonis.
61,58	- 2. 22. 35,52				2,40				35. 24. 30,36	γ Ursæ Maj. R.
	- 2. 22. 34,30								35. 24. 31,58	γ Ursæ Majoris.
	54. 26. 30,21	29,976	54,4	52,7	1. 21,12	1,46	8,184	20,09	92. 15. 18,24	Jupiter.
	29. 32. 23,05				32,93	2,18			67. 20. 2,08	Pallas.
	44. 57. 42,90		53,8	51,4	58,13	3,21			82. 45. 46,10	Ceres.
60,30	- 39. 19. 21,74				47,70				- 1. 33. 1,16	Polaris SP. R.
	- 39. 19. 23,09								- 1. 33. 2,51	Polaris SP.
61,97	- 26. 3. 39,96	29,918	51,0	48,0	28,64				11. 42. 59,68	ζ Ursæ Min. R.
	- 26. 3. 37,97								11. 43. 1,67	ζ Ursæ Minoris.
	71. 48. 29,21	29,900	50,5	47,8	2. 56,30	0,90	9,259	8,87	109. 38. 41,76	Saturn.
	54. 26. 23,46	30,040	46,0	44,5	1. 22,67	1,46	12,064	20,40	92. 14. 32,55	Jupiter.

Coincidence of Micrometer Wire with fixed Wire = 10°, 104 at the middle Wire. From May 20 = 10°, 105, 10°, 106, 10°, 109, 10°, 116, 10°, 118 at the five wires.

One Micrometer Revolution = 20'', 873.

Correction for Runs = - 3'', 5.

Adopted Zenith Point = 43°. 27'. 0'', 97.

Assumed Co-latitude = 37°. 47'. 8'', 28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer; or Time by Molyneux.  h. m. s.	Correction for Microm. or Time.  ' "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
May 23	⊙ N.L. M.....	74.50	3.21,8	22,4	23,0	22,8	21,0	20,8	10,580	-9,83	74.53.11,74	G.
	⊙ S.L. ....	75.20	4.49,5	48,9	51,0	48,6	49,8	46,2			75.24.48,43	G.
May 25	Jupiter N.L.....	97.50	0.45,0	44,9	45,9	46,4	42,8	46,1			97.50.45,10	G.
	(a) Pallas.....	72.55	4.50,8	48,2	52,7	50,7	48,2	52,2			72.59.50,47	G.
	Ceres.....	88.45	1.25,1	24,0	24,8	24,3	21,8	25,8			88.46.24,13	G.
	Polaris SP. R. M.	262.45	2.18,7	16,0	18,8	17,6	15,2	18,8	12,588	-51,75	262.46.25,50	G.
	Polaris SP.....	4.5	2.43,3	41,4	43,4	41,8	41,3	42,7			4.7.42,00	G.
	α Virginis.....	112.55	2.20,2	19,1	20,4	19,0	16,7	18,8			112.57.18,77	G.
	(b) N.L.....	112.55	5.6,0	5,0	6,3	3,8	3,3	0,9		+6,96	113.0.10,59	G.
	N.L. M.....	112.55	5.6,0	5,0	6,3	3,8	3,3	0,9	9,967	+2,91	113.0.10,02	G.
	N.L. M.....	112.55	5.6,0	5,0	6,3	3,8	3,3	0,9	9,820	+3,48	113.0.9,66	G.
	N.L. M.....	112.55	5.6,0	5,0	6,3	3,8	3,3	0,9	9,662	+6,03	113.0.9,62	G.
	N.L. M.....	112.55	5.6,0	5,0	6,3	3,8	3,3	0,9	9,557	+9,47	113.0.8,38	G.
	N.L. M.....	112.55	5.6,0	5,0	6,3	3,8	3,3	0,9		-3,48		
	N.L. M.....	112.55	5.6,0	5,0	6,3	3,8	3,3	0,9		+11,71		
	N.L. M.....	112.55	5.6,0	5,0	6,3	3,8	3,3	0,9		-6,96		
	Saturn N.L.....	115.10	2.47,8	45,2	47,0	46,8	42,8	45,8			115.12.45,58	G.
	η Herculis.....	89.45	1.56,3	54,0	58,4	55,9	53,7	56,3			89.46.55,55	G.
	(c) * R. 16 <sup>h</sup> .30 <sup>m</sup> .16 <sup>s</sup> .	85.50	0.39,0	38,0	39,4	39,7	36,0	40,8			85.50.38,75	G.
	ι Herculis.....	86.45	1.19,5	18,0	19,9	19,3	16,4	19,8			86.46.18,67	G.
	ι Ophiuchi.....	85.10	3.7,5	5,9	8,8	5,9	4,9	4,9			85.13.5,95	G.
	ε Ursæ Min. R. M.	253.30	2.21,0	21,3	20,8	21,4	18,3	21,1	14,468	-1.30,98	253.30.49,40	G.
	ε Ursæ Minoris...	13.20	3.19,3	16,8	19,1	16,3	14,8	17,3			13.23.16,88	G.
	(d) α Herculis R. M.	185.45	4.20,0	20,2	20,2	20,4	18,0	19,0	9,969	+2,92	185.49.22,05	G.
	α Herculis.....	81.0	4.39,0	38,4	39,7	37,3	38,1	37,7			81.4.37,83	G.
May 26	(e) N.L.....	117.25	4.62,4	64,4	63,0	62,0	63,4	58,8		+6,04	117.30.7,79	G.
	N.L. M.....	117.25	4.62,4	64,4	63,0	62,0	63,4	58,8	9,976	+2,72	117.30.7,49	G.
	N.L. M.....	117.25	4.62,4	64,4	63,0	62,0	63,4	58,8	9,898	+3,02	117.30.6,15	G.
	N.L. M.....	117.25	4.62,4	64,4	63,0	62,0	63,4	58,8	9,781	+4,40	117.30.5,72	G.
	N.L. M.....	117.25	4.62,4	64,4	63,0	62,0	63,4	58,8	9,724	+6,99	117.30.3,93	G.
	N.L. M.....	117.25	4.62,4	64,4	63,0	62,0	63,4	58,8		-3,02		
	N.L. M.....	117.25	4.62,4	64,4	63,0	62,0	63,4	58,8		+8,22		
	N.L. M.....	117.25	4.62,4	64,4	63,0	62,0	63,4	58,8		-6,04		
	χ Libræ.....	118.50	3.47,7	49,0	47,9	47,2	47,4	45,0			118.53.46,92	G.
	α Serpentis R. M.	178.5	4.24,0	24,2	23,6	22,7	23,5	22,8	5,048	+1.45,64	178.11.8,59	G.
	α Serpentis.....	88.40	2.56,0	55,9	57,6	55,2	53,3	55,3			88.42.55,22	G.
	b Scorpii.....	120.50	1.8,7	9,5	9,6	10,3	7,6	9,8			120.51.9,12	G.
May 27	⊙ N.L. M.....	74.10	0.22,1	26,1	24,8	28,2	26,0	26,7	12,685	-53,78	74.9.31,82	G.
	⊙ S.L. ....	74.40	1.3,4	7,3	7,3	8,1	6,0	5,5			74.41.6,13	G.
	(f) Mars, center....	89.40	1.50,2	51,0	50,7	53,3	51,4	51,8		-0,19	89.41.50,99	G.
	β Leonis R. M....	186.40	2.19,8	20,0	18,8	23,2	20,7	22,3	7,940	+45,28	186.43.5,81	G.
	β Leonis.....	80.10	0.55,5	55,5	57,1	59,3	56,9	57,1			80.10.56,80	G.
	γ Ursæ Maj. R. M.	225.45	4.13,8	12,2	9,9	10,8	11,8	9,8	8,859	+26,08	225.49.36,98	G.
	γ Ursæ Majoris...	41.0	4.27,2	25,3	26,1	25,6	27,0	23,8			41.4.25,32	G.
	Jupiter N.L.....	97.45	4.46,0	51,6	48,3	49,2	48,5	47,0			97.49.47,87	G.
	Saturn N.L.....	115.10	1.25,2	27,0	25,8	28,2	25,4	28,8			115.11.26,57	G.
	(g) * R. 16 <sup>h</sup> .30 <sup>m</sup> .16 <sup>s</sup> .	85.50	0.38,2	38,7	39,7	40,8	37,1	42,4		+0,11	85.50.39,53	G.
	A.S.C. 552. SP.	285.10	1.40,2	41,3	40,3	42,5	37,7	43,1	18,719	-2.59,71	285.8.40,91	G.
	R. M.....											
	A.S.C. 552. SP....	341.45	0.23,8	21,8	22,4	24,8	19,8	27,8			341.45.23,35	G.
	ε Ursæ Min. R. M.	253.30	2.16,3	17,2	16,0	17,4	16,0	17,4	14,228	-1.25,98	253.30.50,47	G.
	ε Ursæ Minoris...	13.20	3.16,9	14,8	15,7	15,8	14,9	15,8			13.23.15,27	G.
	(h) A.S.C. 1972.....	127.50	3.8,8	10,1	10,0	10,9	8,3	8,9		-0,86	127.53.8,27	G.
	α Herculis.....	70.55	4.42,4	44,8	44,0	41,7	43,8	43,7			70.59.42,85	G.
	(h) 33 Scorpii.....	119.40	1.24,5	27,8	26,0	26,4	23,8	27,5		-0,60	119.41.25,23	G.
	ρ Herculis.....	58.20	1.57,8	59,0	58,8	56,9	56,8	59,2			58.21.57,85	G.
	(i) Mercury, center...	83.25	1.8,1	8,0	8,8	9,1	9,8	8,3			83.26.8,55	G.
May 28	(k) ⊙ S.L. M.....	74.30	1.9,5	19,7	8,8	19,1	13,4	14,8	10,520	-8,58	74.31.5,37	G.
	N.L.....	73.55	4.27,3	34,3	24,8	31,5	32,5	27,4			73.59.28,67	G.

Runs were taken immediately after the Sun on May 28, and used for that observation only.

(a) No correction for runs. (b) At the five wires. (c) About the 8th magnitude. (d) Mercury disturbed by wind. (e) At the five wires; very badly defined. (f) At the comb. Correction for change of N.P.D. = -0",33. (g) At the 5th wire. (h) At the comb. (i) Faint and unsatisfactory. (k) The Sun had been shining on the instrument until about ten minutes before the observation.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
63,75	31.26.10,77	29,994	51,6	52,8	35,53	4,39		15.48,60	69.29.38,79	☉.
	31.57.47,46				36,27	4,45			69.29.38,96	☉.
	54.23.44,13	30,076	46,0	44,0	1.22,72	1,45	8,217	19,75	92.12.33,43	Jupiter.
	29.32.49,50				33,64	2,12			67.20.29,30	Pallas.
	45.19.23,16				59,97	3,16			83.7.28,25	Ceres.
	-39.19.24,53								-1.33.4,84	Polaris SP. R.
	-39.19.18,97				48,59				-1.32.59,28	Polaris SP.
	69.30.17,80		44,8	42,2	2.38,11				107.20.4,19	α Virginis.
	69.33.9,62			41,3					106.47.10,56	♃.
	69.33.9,05								106.47.9,99	♃.
63,14	69.33.8,69				2.38,80	50.30,09		14.43,95	106.47.9,63	♃.
	69.33.8,65								106.47.9,59	♃.
	69.33.7,41								106.47.8,35	♃.
	71.45.44,61	30,090	42,0	39,8	2.59,93	0,90	9,318	8,26	109.36.0,18	Saturn.
	46.19.54,58				1.2,69				84.8.5,55	η Herculis.
	42.23.37,78				54,65				80.11.40,71	* R.16 <sup>h</sup> .30 <sup>m</sup> .16 <sup>s</sup>
	43.19.17,70				56,45				81.7.22,43	ι Herculis.
	41.46.4,98				53,46				79.34.6,72	ι Ophiuchi.
	-30.3.48,43		41,4	39,3	34,71				7.42.45,14	ε Ursæ Min. R.
	-30.3.44,09								7.42.49,48	ε Ursæ Minoris.
59,94	37.37.38,92				46,20				75.25.33,40	α Herculis R.
	37.37.36,86								75.25.31,34	α Herculis.
	74.3.6,82	30,118	47,0	46,2					111.16.26,08	♃.
	74.3.6,52								111.16.25,78	♃.
	74.3.5,18				3.24,19	51.59,83		14.46,62	111.16.24,44	♃.
	74.3.4,75								111.16.24,01	♃.
	74.3.2,96								111.16.22,22	♃.
	75.26.45,95			44,7	3.44,82				113.17.39,05	χ Libræ.
	45.15.52,38				59,85				83.4.0,51	α Serpentis R.
	45.15.54,25				4.19,74				83.4.2,38	α Serpentis.
61,91	77.24.8,15								115.15.36,17	♃ Scorpii.
	30.42.30,85	30,136	54,8	58,2	34,31	4,29		15.48,00	68.45.57,15	☉.
	31.14.5,16				35,03	4,36			68.45.56,11	☉.
	46.14.50,02	30,138	59,3	58,4	1.0,26	5,87			84.2.52,69	Mars.
	36.43.55,16			57,0	43,20				74.31.46,64	β Leonis R.
	36.43.55,83								74.31.47,31	β Leonis.
	-2.22.36,01				2,40				35.24.29,87	γ Ursæ Maj. R.
	-2.22.35,65								35.24.30,23	γ Ursæ Majoris.
	54.22.46,90			54,8	1.21,03	1,44	8,188	20,05	92.11.34,82	Jupiter.
	71.44.25,60	30,148	49,8	47,4	2.57,19	0,90	9,318	8,26	109.34.38,43	Saturn.
62,13	42.23.38,56				53,90				80.11.40,74	* R.16 <sup>h</sup> .30 <sup>m</sup> .16 <sup>s</sup>
	-61.41.39,94				1.49,28				-23.56.20,94	A.S.C. 552. SP. R.
	-61.41.37,62								-23.56.18,62	A.S.C. 552. SP.
	-30.3.49,50			46,7	34,24				7.42.44,54	ε Ursæ Min. R.
	-30.3.45,70								7.42.48,34	ε Ursæ Minoris.
	84.26.7,30				9.10,20				122.22.25,78	A.S.C. 1972.
	27.32.41,88				30,86				65.20.21,02	α Herculis.
	76.14.24,26				3.57,12				114.5.29,66	33 Scorpii.
	14.54.56,88				15,76				52.42.20,92	ρ Herculis.
	39.59.7,58	30,190	52,3	52,6	49,07	6,26			77.46.58,67	Mercury.
62,87	31.4.4,40	30,192	55,8	56,0	35,02	4,33		15.47,80	68.35.55,57	☉.
	30.32.27,70				34,30	4,27			68.35.53,81	☉.

Coincidence of Micrometer Wire with fixed Wire = 10', 105, 10', 106, 10', 109, 10', 116, 10', 118 at the five wires.

One Micrometer Revolution = 20'', 873.

Correction for Runs = -3'', 5. For the Sun on May 28 = -6'', 5.

Adopted Zenith Point = 43°. 27'. 0'', 97.

Assumed Co-latitude = 37°. 47'. 8'', 28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  h. m. s.	Correction for Microm. or Time.  ' "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
May 28	Capella R. M. ....	217. 0	4. 21,0	19,0	19,9	19,0	21,3	20,0	11,097	- 20,63	217. 3. 58,89	G.
	Capella.....	49. 45	5. 2,3	5,5	2,0	3,0	7,7	0,0			49. 50. 2,82	G.
	Venus N.L.....	70. 50	2. 29,4	30,7	28,0	30,9	32,0	29,8			70. 52. 29,85	G.
	Mars, center.....	89. 50	1. 20,9	20,0	20,9	23,0	22,5	21,7	6,009	+ 1. 25,58	89. 51. 21,35	G.
	Jupiter S.L.....	97. 50	0. 4,3	4,1	5,0	6,3	2,4	5,8			97. 50. 4,63	G.
	Spica R. M.....	160. 55	0. 11,9	13,1	12,1	13,8	12,2	14,9			160. 56. 38,56	G.
	Spica.....	105. 55	2. 23,5	23,1	23,8	25,0	23,8	23,3	14,358	- 1. 28,53 - 0,18 + 0,72	105. 57. 23,47	G.
	(a) η Ursæ Maj. R. M.	221. 20	2. 47,1	46,4	45,5	48,0	45,3	46,2			221. 21. 17,37	G.
	η Ursæ Majoris...	45. 30	2. 45,0	43,3	44,1	44,3	43,8	44,3			45. 32. 44,54	G.
	(b) η Bootis R. M.....	190. 25	2. 45,0	43,4	44,9	45,9	44,3	44,8	12,103	- 41,62	190. 27. 2,78	G.
	η Bootis.....	76. 25	1. 57,0	55,8	58,0	57,8	55,2	57,3			76. 26. 56,63	G.
	* R. 15 <sup>h</sup> . 20 <sup>m</sup> . 30 <sup>s</sup> .	112. 30	0. 20,8	19,4	22,3	22,8	20,0	23,0			112. 30. 21,35	G.
	A.S.C. 1752.....	112. 15	4. 18,9	17,5	19,3	18,6	19,4	16,3	(c) Mercury, center..	83. 0	112. 19. 17,83	G.
											83. 1. 19,95	G.
May 29	(d) ☉ N.L. M.....	73. 50	0. 39,0	41,8	41,2	42,3	41,1	41,8	12,555	- 51,06	73. 49. 50,06	G.
	☉ S.L.....	74. 20	1. 21,9	22,6	23,2	24,4	24,0	24,3			74. 21. 23,23	G.
	Capella R. M.....	217. 0	4. 9,8	7,8	8,9	8,9	9,2	7,3			217. 3. 59,17	G.
	Capella.....	49. 45	4. 62,4	63,4	63,3	62,4	66,5	59,0	9,470	+ 13,34	49. 50. 2,25	G.
	(e) β Tauri R. M.....	199. 40	2. 21,9	20,8	21,7	22,9	21,3	22,4			199. 42. 34,91	G.
	β Tauri.....	67. 10	1. 24,0	24,1	24,0	25,2	26,2	25,5			67. 11. 24,67	G.
	Venus N.L.....	70. 55	4. 33,0	34,9	33,0	34,1	37,0	32,4	10,201	+ 0,42 - 1,98 + 0,21	70. 59. 33,53	G.
	Mars, center.....	90. 0	0. 58,9	57,9	60,8	61,8	59,2	60,2			90. 0. 59,68	G.
	Jupiter N.L.....	97. 45	4. 7,2	6,4	7,0	7,2	7,1	6,4			97. 49. 6,40	G.
	Saturn N.L.....	115. 10	0. 8,0	8,0	8,4	10,5	5,4	11,8	10,210	- 2,11	115. 10. 8,67	G.
	ι Herculis.....	86. 45	1. 18,4	17,9	19,0	20,0	17,0	20,0			86. 46. 18,57	G.
	* R. 17 <sup>h</sup> . 4 <sup>m</sup> . 40 <sup>s</sup> ...	95. 5	0. 37,9	37,2	38,8	38,8	35,9	40,9			95. 5. 38,18	G.
	(f) S.L.....	125. 5	2. 10,0	10,0	11,7	11,4	9,9	10,9	10,210	- 1,48 - 0,21	125. 7. 10,82	G.
	» S.L. M.....	125. 5	2. 10,0	10,0	11,7	11,4	9,9	10,9			125. 7. 8,63	G.
	» S.L. M.....	125. 5	2. 10,0	10,0	11,7	11,4	9,9	10,9			125. 7. 8,29	G.
	» S.L. M.....	125. 5	2. 10,0	10,0	11,7	11,4	9,9	10,9	10,211	- 1,94 - 0,42	125. 7. 8,71	G.
	» S.L. M.....	125. 5	2. 10,0	10,0	11,7	11,4	9,9	10,9			125. 7. 8,04	G.
May 30	☉ S.L. M.....	74. 10	2. 36,0	36,5	36,6	36,5	38,0	35,0	11,370	- 26,31	74. 12. 9,82	G.
	☉ N.L.....	73. 40	0. 33,7	35,2	34,4	35,3	34,0	35,1			73. 40. 34,55	G.
	Capella R. M.....	217. 0	4. 18,8	18,0	16,9	16,8	18,0	15,7			217. 3. 59,15	G.
	Capella.....	49. 45	5. 3,3	5,1	3,8	3,3	6,4	0,8	10,958	- 17,72	49. 50. 3,18	G.
	Venus S.L.....	71. 5	2. 18,2	18,2	18,2	17,8	18,8	16,7			71. 7. 17,72	G.
	Mars, center.....	90. 10	0. 49,2	47,1	51,0	49,4	48,1	49,4			90. 10. 48,93	G.
May 31	Mercury, center..	81. 40	0. 16,8	16,0	19,2	19,0	15,7	18,2			81. 40. 17,45	G.
June 1	☉ N.L. M.....	73. 25	0. 18,9	20,9	20,8	22,2	19,0	20,9	16,378	- 2. 10,85	73. 23. 9,57	G.
	(g) ☉ S.L.....	73. 50	4. 41,4	41,8	42,8	42,3	39,8	42,2			73. 54. 41,75	G.
	(g) Venus N.L.....	71. 20	4. 42,4	41,4	42,3	43,3	42,0	44,8			71. 24. 42,73	G.
	Mars, center.....	90. 30	0. 49,2	48,9	50,0	49,2	48,8	49,7	7,720	+ 49,87	90. 30. 49,20	G.
	Jupiter N.L.....	97. 45	3. 40,5	38,5	39,8	39,3	38,0	37,8			97. 48. 38,57	G.
	α Cor. Bor. R. M.	198. 25	4. 16,1	13,3	15,8	14,8	13,3	13,8			198. 30. 3,89	G.
	α Coronæ Borealis.	68. 20	3. 62,0	58,1	60,2	58,7	57,3	58,8	4,798	+ 1. 50,86	68. 23. 58,72	G.
	α Serpentis.....	178. 5	4. 20,0	15,9	18,7	17,2	17,0	17,9			178. 11. 8,14	G.
	ζ Ursæ Min. R. M.	88. 40	2. 56,8	54,0	55,9	56,3	52,5	55,1			88. 42. 54,77	G.
	ζ Ursæ Minoris...	249. 30	2. 21,6	19,0	18,9	19,7	17,2	21,2	14,600	- 1. 33,74	249. 30. 45,59	G.
	ζ Ursæ Minoris...	17. 20	3. 22,4	20,0	21,0	19,4	19,4	20,4			17. 23. 20,05	G.
	Saturn N.L.....	115. 5	3. 10,5	9,0	9,8	9,3	4,3	8,1			115. 8. 8,13	G.
	ι Herculis.....	86. 45	1. 21,0	16,0	18,6	18,8	17,0	19,8			86. 46. 18,38	G.
	ι Ophiuchi.....	85. 10	3. 8,8	5,1	7,0	5,3	4,4	4,8			85. 13. 5,53	G.

(a) At the 4th and 5th wires.

(b) Blur, occasioned by wind.

(c) Dancing.

(d) Much waving.

(e) Extremely faint.

(f) At the five wires. Limb very bad on account of its small altitude.

(g) Small correction for runs on the negative side.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
60,86	6.23. 2,08	30,192	55,8	56,0	6,51				44. 10. 16,87	Capella R.
	6.23. 1,85								44. 10. 16,64	Capella.
	27.25. 28,88	30,162	56,8	58,6	29,98	3,37	9,378	7,63	65. 13. 11,40	Venus.
	46.24. 20,38	30,150	57,0	57,0	1. 0,79	5,85			84. 12. 23,60	Mars.
61,02	54.23. 3,66	30,158	54,8	53,0	1. 21,39	1,43	12,007	19,81	92. 11. 12,09	Jupiter.
	62.30. 22,41			51,2	1. 52,21				100. 19. 22,90	Spica R.
	62.30. 22,50								100. 19. 22,99	Spica.
	2. 5. 43,60								39. 52. 54,03	$\eta$ Ursæ Maj. R.
60,96	2. 5. 43,57				2,15				39. 52. 54,00	$\eta$ Ursæ Majoris.
59,71	32.59. 58,19				38,07				70. 47. 44,54	$\eta$ Bootis R.
	32.59. 55,66								70. 47. 42,01	$\eta$ Bootis.
	69. 3. 20,38		48,0	45,2	2. 33,92				106. 53. 2,58	* $\mathcal{R}$ .15 <sup>h</sup> .20. <sup>m</sup> 30 <sup>s</sup> .
	68.52. 16,86				2. 32,47				106. 41. 57,61	A.S.C. 1752.
60,71	39.34. 18,98	30,140	55,0	56,7	47,87	6,08			77. 22. 9,05	Mercury.
	30.22. 49,09	30,138	61,0	60,8	33,69	4,25		15. 47,70	68. 26. 14,51	☉.
	30.54. 22,26				34,40	4,31			68. 26. 12,93	☉.
	6.23. 1,80				6,43				44. 10. 16,51	Capella R.
59,79	6.23. 1,28								44. 10. 15,99	Capella.
	23.44. 26,06				25,28				61. 31. 59,62	$\beta$ Tauri R.
	23.44. 23,70								61. 31. 57,26	$\beta$ Tauri.
	27.32. 32,56	30,116	63,4	64,4	29,74	3,41	9,364	7,77	65. 20. 14,94	Venus.
61,17	46.33. 58,71	30,092	62,0	60,2	1. 0,62	5,82			84. 22. 1,79	Mars.
	54.22. 5,43	30,094	57,0	54,6	1. 20,91	1,43	8,140	20,55	92. 10. 53,74	Jupiter.
	71.43. 7,70	30,080	49,5	47,7	2. 56,46	0,90	9,392	7,49	109. 33. 19,03	Saturn.
	43.19. 17,60				55,51				81. 7. 21,39	$\iota$ Herculis.
61,31	51.38. 37,21			47,3	1. 14,39				89. 26. 59,88	* $\mathcal{R}$ .17 <sup>h</sup> .4 <sup>m</sup> .40 <sup>s</sup> .
	81.40. 9,85	30,074	48,7	47,0					118. 24. 5,97	☾.
	81.40. 7,66								118. 24. 3,78	☾.
	81.40. 7,32				6. 23,58	54. 32,48		15. 3,26	118. 24. 3,44	☾.
61,46	81.40. 7,74								118. 24. 3,86	☾.
	81.40. 7,07								118. 24. 3,19	☾.
	30.45. 8,85	30,048	56,6	57,5	34,32	4,29		15. 47,50	68. 16. 59,66	☉.
	30.13. 33,58				33,61	4,23			68. 16. 58,74	☉.
62,82	6.23. 1,82			59,2	6,43				44. 10. 16,53	Capella R.
	6.23. 2,21								44. 10. 16,92	Capella.
	27.40. 16,75	30,028	61,7	61,0	30,02	3,44	9,393	7,48	65. 27. 59,09	Venus.
	46.43. 47,96	30,000	55,5	54,1	1. 1,53	5,79			84. 31. 51,98	Mars.
61,31	38. 13. 16,48	29,914	53,4	53,8	45,55	5,56			76. 1. 4,75	Mercury.
	29.56. 8,60	29,920	56,4	56,3	33,16	4,19		15. 47,20	67. 59. 33,05	☉.
	30.27. 40,78				33,86	4,26			67. 59. 31,46	☉.
	27.57. 41,76	29,900	58,8	58,7	30,40	3,52	9,380	7,62	65. 45. 24,54	Venus.
61,31	47. 3. 48,23	29,878	55,0	53,3	1. 2,10	5,75			84. 51. 52,86	Mars.
	54.21. 37,60		52,4	50,1	1. 21,05	1,42	8,185	20,08	92. 10. 25,59	Jupiter.
	24.56. 57,08		47,3	45,1	27,37				62. 44. 32,73	$\alpha$ Coron. Bor. R.
	24.56. 57,75								62. 44. 33,40	$\alpha$ Coronæ Bor.
61,46	45.15. 52,83				59,32				83. 4. 0,43	$\alpha$ Serpentis R.
	45.15. 53,80								83. 4. 1,40	$\alpha$ Serpentis.
	-26. 3. 44,62				28,77				11. 42. 54,89	$\zeta$ Ursæ Min. R.
	-26. 3. 40,92								11. 42. 58,59	$\zeta$ Ursæ Minoris.
62,82	71.41. 7,16			44,7	2. 56,05	0,90	9,354	7,88	109. 31. 18,47	Saturn.
	43.19. 17,41				55,48				81. 7. 21,17	$\iota$ Herculis.
	41.46. 4,56				52,55				79. 34. 5,39	$\iota$ Ophiuchi.

Coincidence of Micrometer Wire with fixed Wire = 10',105, 10',106, 10',109, 10',116, 10',118 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = - 3'',5.

Adopted Zenith Point = 43°.27'.0'',97.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  r. h. m. s.	Correction for Microm. or Time.  " "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			" "	" "	" "	" "	" "	" "				
June 4.	(a) Jupiter S.L.....	97.45	4.29,5	30,4	28,3	29,6	29,7	26,4	13,978	- 0,46	97.49.28,48	G.
	(b) Saturn S.L.....	115.5	1.28,7	31,8	28,3	30,2	26,2	30,2			115.6.28,61	G.
	* R. 16 <sup>h</sup> . 30 <sup>m</sup> . 15 <sup>s</sup> .	85.50	0.38,9	38,9	38,4	39,7	38,2	40,8			85.50.39,08	G.
	† Ophiuchi.....	85.10	3.6,6	5,8	6,5	5,4	4,5	4,0			85.13.5,12	G.
	ε Ursæ Min. R. M.	253.30	2.12,3	12,3	12,0	12,8	12,2	13,1			253.30.51,44	G.
	ε Ursæ Minoris...	13.20	3.12,0	11,1	10,4	9,8	10,8	9,0			13.23.10,15	G.
June 5	Mars, center.....	91.10	2.21,7	20,5	19,3	23,4	20,4	23,5	10,224	- 9,60 + 2,47 - 4,80 - 8,35 - 14,69 + 4,80 - 19,87 + 9,60 - 2,59	91.12.21,20	G.
	(c) ) N.L.....	94.25	4.26,4	27,8	27,4	28,0	28,8	24,7			94.29.17,08	G.
	) N.L. M.....	94.25	4.26,4	27,8	27,4	28,0	28,8	24,7			94.29.19,41	G.
	) N.L. M.....	94.25	4.26,4	27,8	27,4	28,0	28,8	24,7			94.29.18,33	G.
	) N.L. M.....	94.25	4.26,4	27,8	27,4	28,0	28,8	24,7			94.29.16,79	G.
	) N.L. M.....	94.25	4.26,4	27,8	27,4	28,0	28,8	24,7			94.29.16,41	G.
	α Cassiopeiæ R. M.	226.50	3.17,4	17,1	16,0	17,4	17,3	15,1			226.53.13,76	G.
	α Cassiopeiæ.....	40.0	0.50,8	51,0	51,5	51,9	51,0	51,8			40.0.51,23	G.
	Polaris R. M.....	259.40	1.22,9	21,1	20,5	22,8	20,4	23,2			259.40.24,87	G.
	Polaris.....	7.10	3.39,9	38,6	39,8	39,8	41,0	38,1			7.13.39,12	G.
	Mercury, center...	79.5	4.32,0	25,7	22,8	25,4	25,8	20,9			79.9.23,27	G.
June 6	⊙ S.L. M.....	73.15	3.32,7	35,2	32,0	33,9	35,7	31,9	12,078	- 41,10	73.17.52,07	G.
	⊙ N.L.....	72.45	1.16,3	19,2	16,6	18,8	17,2	17,7			72.46.17,48	G.
	(d) Capella R. M.....	217.0	4.41,9	41,0	39,3	40,9	42,2	39,0			217.3.58,89	G.
	Capella.....	49.45	5.2,9	5,0	2,0	3,1	5,9	0,3			49.50.2,63	G.
	Venus N.L.....	72.15	4.21,4	22,3	21,1	20,8	23,0	18,6			72.19.20,70	G.
	α Ursæ Maj. R. M.	233.50	2.14,9	11,8	12,4	12,2	11,5	12,6			233.51.17,61	G.
	α Ursæ Majoris...	33.0	2.46,3	47,3	45,3	45,8	46,1	45,7			33.2.45,77	G.
	Mars, center.....	91.20	3.2,0	3,4	2,3	4,8	2,4	1,8			91.23.2,45	G.
June 8	(e) ⊙ S.L. M.....	73.5	2.17,9	19,7	18,7	18,8	17,2	17,8	14,155	- 1.23,59	73.5.54,38	G.
	⊙ N.L.....	72.30	4.20,7	20,9	19,7	19,4	20,7	16,5			72.34.18,93	G.
	Saturn S.L.....	115.0	3.59,8	60,0	59,5	59,7	59,5	57,2			115.3.58,62	G.
June 9	Mercury, center...	77.0	2.17,2	17,0	18,5	18,9	17,2	15,7	12,439	- 48,72	77.2.17,03	G.
June 10	⊙ S.L. M.....	72.55	1.16,6	16,6	17,4	18,1	16,1	16,4			72.55.27,93	G.
	⊙ N.L.....	72.20	3.57,8	55,3	57,9	57,2	58,0	53,8			72.23.56,02	G.
	Mars, center.....	92.5	1.59,7	59,2	59,0	61,4	58,8	57,9			92.6.59,00	G.
June 11	Jupiter S.L.....	97.50	1.40,4	39,5	39,3	41,8	40,0	39,5	9,528	+ 12,05	97.51.39,80	G.
	⊙ N.L. M.....	72.15	4.10,8	12,9	10,3	10,8	13,0	7,7			72.19.22,27	G.
	⊙ S.L.....	72.50	0.51,3	51,0	52,1	53,2	51,7	51,8			72.50.51,70	G.
	Venus N.L.....	73.25	3.61,0	63,1	62,9	64,3	64,0	59,3			73.29.1,77	G.
	Capella R. M.....	217.5	0.19,7	15,1	17,3	20,4	16,3	20,4			217.3.56,47	G.
June 12	Capella.....	49.50	0.4,0	0,0	3,8	5,1	4,4	4,3	14,018	- 1.21,68	49.50.3,58	G.
	⊙ S.L. M.....	72.45	2.15,5	15,0	16,1	18,0	16,8	15,1			72.46.41,00	G.
	⊙ N.L.....	72.15	0.9,4	7,5	9,8	11,5	9,4	9,8			72.15.9,53	G.
	Mars, center.....	92.25	4.41,8	37,8	39,9	43,0	42,1	39,2			92.29.39,85	G.
June 13	Jupiter S.L.....	97.50	2.61,5	57,0	60,0	62,8	60,2	58,3	12,588	- 51,83	97.52.59,47	G.
	⊙ N.L. M.....	72.10	2.16,8	19,0	15,0	19,0	18,0	15,2			72.11.24,95	G.
	⊙ S.L.....	72.40	2.55,0	57,3	54,4	57,4	58,4	53,9			72.42.55,58	G.
June 15	Saturn N.L.....	114.55	4.22,3	18,2	20,8	20,4	16,2	17,0	11,508	- 29,28	114.59.18,65	G.
	* R. 17 <sup>h</sup> . 4 <sup>m</sup> . 40 <sup>s</sup> ...	95.5	0.38,2	33,0	35,2	36,8	31,7	37,2			95.5.35,28	G.
	(f) * R. 17 <sup>h</sup> . 12 <sup>m</sup> . 30 <sup>s</sup> .	66.35	4.55,5	50,8	54,0	54,0	49,3	54,5			66.39.53,02	G.
	(g) α Herculis.....	70.55	4.41,8	37,9	39,4	40,4	35,2	42,4			70.59.39,55	G.
	ρ Herculis M.....	58.20	2.27,0	23,8	23,9	24,4	21,8	25,4			58.21.54,82	G.

Coincidence at middle wire and Runs taken June 5, 1<sup>h</sup>. The coincidence found to be the same as before.  
Coincidence at middle wire and Runs taken June 11, 23<sup>h</sup>. Runs taken June 16, 23<sup>h</sup>.

- (a) At the 5th wire. The corrections for change of N.P.D. and curvature of path are both insensible.  
(b) At the comb. Correction for change of N.P.D. = +0".02. (c) At the five wires; hazy. (d) Unsteady.  
(e) Without dark glass. (f) No correction for runs. (g) Small correction for runs on the negative side.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
60,80	54.22.27,51	29,640	55,2	55,5	1.19,56	1,41	12,004	19,69	92.10.34,25	Jupiter.
	71.39.27,64	29,666	51,8	49,7	2.52,73	0,90	10,910	8,25	109.29.19,50	Saturn.
	42.23.38,11				52,79				80.11.39,18	*R.16 <sup>h</sup> .30 <sup>m</sup> .15 <sup>s</sup> .
	41.46.4,15				51,64				79.34.4,07	† Ophiuchi.
	-30.3.50,47				33,49				7.42.44,32	ε Ursæ Min. R.
	-30.3.50,82								7.42.43,97	ε Ursæ Minoris.
	47.45.20,23	29,780	57,5	61,5	1.2,38	5,65			85.33.25,24	Mars.
	51.2.16,11	29,846	56,0	56,6					88.20.47,85	).
	51.2.18,44								88.20.50,18	).
	51.2.17,36				1.10,87	45.58,45		16.11,04	88.20.49,10	).
	51.2.15,82								88.20.47,56	).
	51.2.15,44								88.20.47,18	).
62,50	-3.26.12,79								34.20.52,04	α Cassiopeiæ R.
	-3.26.9,74				3,45				34.20.55,09	α Cassiopeiæ.
62,00	-36.13.23,90	29,852	57,8	58,4	41,89				1.33.2,49	Polaris R.
	-36.13.21,85								1.33.4,54	Polaris.
	35.42.22,30	29,860	63,8	64,7	40,60	4,76			73.30.6,42	Mercury.
60,76	29.50.51,10	29,866	65,7	66,5	32,31	4,17		15.46,60	67.22.40,92	☉.
	29.19.16,51				31,63	4,11			67.22.58,91	☉.
	6.23.2,08				6,30				44.10.16,66	Capella R.
	6.23.1,66								44.10.16,24	Capella.
	28.52.19,73	29,856	65,0	64,9	31,14	3,74	9,383	7,60	66.40.3,01	Venus.
61,69	-10.24.16,64	29,840	63,7	63,4	10,40				27.22.41,24	α Ursæ Maj. R.
	-10.24.15,20								27.22.42,68	α Ursæ Majoris.
	47.56.1,48		63,0	62,4	1.2,78	5,63			85.44.6,91	Mars.
	29.38.53,41	29,804	63,0	63,6	32,17	4,15		15.46,40	67.10.43,31	☉.
	29.7.17,96				31,49	4,08			67.10.40,05	☉.
	71.36.57,65	29,794	58,5	57,2	2.50,41	0,90	10,988	9,22	109.26.46,22	Saturn.
	33.35.16,06	30,208	62,3	62,0	38,16	4,21			71.22.58,29	Mercury.
	29.28.26,96	30,200	63,8	64,4	32,32	4,12		15.46,10	67.0.17,34	☉.
	28.56.55,05				31,63	4,06			67.0.17,00	☉.
	48.39.58,03	30,138	64,8	64,5	1.4,78	5,55			86.28.5,54	Mars.
	54.24.38,83	30,132	63,8	63,0	1.19,77	1,38	11,929	19,04	92.12.46,46	Jupiter.
60,03	28.52.21,30	30,160	63,8	65,0	31,45	4,05		15.46,00	66.55.42,98	☉.
	29.23.50,73				32,14	4,11			66.55.41,04	☉.
	30.2.0,80	30,174	66,0	68,0	32,79	4,02	9,287	8,59	67.49.46,44	Venus.
	6.23.4,50	30,094	68,4	69,5	6,31				44.10.19,09	Capella R.
	6.23.2,61								44.10.17,20	Capella.
	29.19.40,03	30,088	68,5	69,7	31,67	4,10		15.45,90	66.51.29,98	☉.
	28.48.8,56				30,99	4,04			66.51.29,69	☉.
	49.2.38,88	30,000	71,5	71,3	1.4,47	5,51			86.50.46,12	Mars.
	54.25.58,50	29,992	70,3	70,0	1.18,38	1,37	11,940	19,15	92.14.4,64	Jupiter.
	28.44.23,98	29,878	70,3	71,4	30,60	4,03		15.45,90	66.47.44,73	☉.
	29.15.54,61				31,26	4,10			66.47.44,15	☉.
	71.32.17,68	30,090	56,3	50,4	2.53,74	0,90	9,263	8,79	109.22.27,59	Saturn.
	51.38.34,31	30,100	53,2	49,2	1.14,14				89.26.56,73	*R.17 <sup>h</sup> .4 <sup>m</sup> .40 <sup>s</sup>
	23.12.52,05				25,21				61.0.25,54	*R.17 <sup>h</sup> .12 <sup>m</sup> .30 <sup>s</sup>
	27.32.38,58				30,65				65.20.17,51	α Herculis.
	14.54.53,85				15,66				52.42.17,79	ρ Herculis.

Coincidence of Micrometer Wire with fixed Wire = 10', 105, 10', 106, 10', 109, 10', 116, 10', 118 at the five Wires.

From June 8 = 10', 105 at the middle Wire.

One Micrometer Revolution = 20'', 873.

Correction for Runs from June 4 = -3'', 4. From June 8 = -5'', 0. From June 15 = -3'', 5.

Adopted Zenith Point = 43°. 27'. 0'', 97.

Assumed Co-latitude = 37°. 47'. 8'', 28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  r. h. m. s.	Correction for Microm. or Time.  ' "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
June 15	* R. 17 <sup>h</sup> . 18 <sup>m</sup> . 40 <sup>s</sup> .	62.50	0.36,0	31,5	34,3	35,0	31,3	36,5	12,918	- 58,72	62.50.34,03	G.
	* R. 17 <sup>h</sup> . 26 <sup>m</sup> . 7 <sup>s</sup> .	60.40	4.12,9	10,9	12,3	12,0	9,4	10,2			60.43.12,08	G.
	79 Herculis.....	71.10	4.57,7	54,0	56,3	54,8	53,1	52,3			71.14.54,13	G.
June 16	Mercury, center...	73.30	5.20,0	19,9	20,1	21,0	20,0	17,0	13,743	- 1.15,94	73.35.19,05	G.
	Capella R. M.....	217.5	0.12,1	9,2	11,9	13,7	8,9	12,8			217.3.55,48	G.
	Capella.....	49.50	0.47	2,9	3,9	6,7	2,7	4,8			49.50.4,27	G.
June 17	☉ N.L. M.....	72.0	0.35,9	35,1	35,0	37,8	36,0	35,8	10,650	- 11,37	72.0.24,50	G.
	☉ S.L.....	72.30	1.53,0	53,3	53,0	54,8	53,9	51,7			72.31.53,07	G.
	Venus N.L.....	75.10	0.42,8	45,4	42,2	48,8	45,0	46,0			75.10.44,95	G.
	(a) ) N.L.....	88.25	4.59,5	61,0	60,8	66,8	63,0	62,7	9,927	+ 8,12 + 3,61 + 4,06	88.30.10,42	G.
	) N.L. M.....	88.25	4.59,5	61,0	60,8	66,8	63,0	62,7			88.30.9,97	G.
	) N.L. M.....	88.25	4.59,5	61,0	60,8	66,8	63,0	62,7			88.30.10,54	G.
	) N.L. M.....	88.25	4.59,5	61,0	60,8	66,8	63,0	62,7	9,548	+ 8,24 + 11,63 - 4,06	88.30.10,54	G.
	) N.L. M.....	88.25	4.59,5	61,0	60,8	66,8	63,0	62,7			88.30.9,87	G.
	) N.L. M.....	88.25	4.59,5	61,0	60,8	66,8	63,0	62,7			88.30.8,81	G.
	Mars, center.....	93.25	3.14,3	14,3	13,0	17,5	15,8	12,5	9,410	+ 14,63 - 8,12	93.28.14,18	G.
	Jupiter N.L.....	97.55	1.49,4	49,4	49,4	54,0	50,9	49,8			97.56.50,27	G.
	(b) Polaris SP. R.....	262.45	1.31,0	24,2	28,8	30,3	27,8	32,0			262.46.28,83	G.
	Polaris SP.....	4.5	2.35,0	31,9	35,2	35,3	37,5	34,2	13,643	- 1.13,86	4.7.34,55	G.
	(c) Mercury, center...	73.10	0.11,2	15,0	13,0	17,7	14,5	14,3			73.10.14,27	G.
	Capella R. M.....	217.5	0.12,7	8,8	10,0	14,0	8,1	14,3			217.3.57,44	G.
	Capella.....	49.50	0.2,0	3,2	2,9	6,5	5,4	3,4			49.50.3,90	G.
June 18	☉ S.L. M.....	72.30	0.37,8	38,9	38,0	41,1	41,0	39,0	11,451	- 28,09	72.30.11,14	G.
	☉ N.L.....	71.55	3.41,9	43,2	41,7	43,8	45,4	39,8			71.58.42,20	G.
June 19	(d) ) N.L.....	100.20	1.55,8	54,1	56,2	58,4	56,9	56,0	9,948	+ 3,28 - 3,98 + 6,53 - 7,96	100.21.56,02	G.
	) N.L. M.....	100.20	1.55,8	54,1	56,2	58,4	56,9	56,0			100.21.55,32	G.
	) N.L. M.....	100.20	1.55,8	54,1	56,2	58,4	56,9	56,0			100.21.54,59	G.
	Jupiter N.L.....	97.55	4.5,9	7,0	7,2	9,8	7,3	4,3	12,608	- 52,25	97.59.6,43	G.
	Polaris SP. R. M.....	262.45	2.20,0	16,8	18,9	20,4	19,0	20,6			262.46.26,77	G.
	Polaris SP.....	4.5	2.33,4	31,1	34,1	34,8	36,1	33,8			4.7.33,58	G.
	Spica R. M.....	160.50	4.29,1	30,3	28,9	30,8	32,2	29,0	4,136	+ 2.4,60	160.56.34,13	G.
	Spica.....	105.55	2.27,9	28,0	26,0	30,7	29,0	26,4			105.57.27,72	G.
	η Ursæ Maj. R. M.....	221.20	2.29,2	28,9	27,2	32,8	29,5	30,2			221.21.18,74	G.
	η Ursæ Majoris...	45.30	2.42,1	41,8	39,8	42,4	41,4	41,7	13,488	- 1.10,61	45.32.41,22	G.
	η Bootis R. M.....	190.25	2.25,0	23,3	22,9	28,1	25,3	23,8			190.27.6,50	G.
	η Bootis.....	76.25	1.55,8	53,7	57,2	59,0	56,0	55,2			76.26.55,93	G.
	Saturn N.L.....	114.55	2.11,0	8,5	10,2	13,1	9,2	10,9	10,965	- 17,95	114.57.10,23	G.
	* R. 17 <sup>h</sup> . 4 <sup>m</sup> . 40 <sup>s</sup> ..	95.5	0.37,6	36,7	36,2	38,5	36,8	38,0			95.5.37,23	G.
	(e) A.S.C. 1972.....	127.50	3.22,1	22,0	21,1	22,8	22,4	20,2			127.53.21,38	G.
June 20	* R. 17 <sup>h</sup> . 12 <sup>m</sup> . 30 <sup>s</sup> ..	66.35	4.52,3	52,1	52,0	52,1	53,8	48,5	4,136	+ 2.4,60	66.39.51,23	G.
	α Herculis.....	70.55	4.40,3	39,2	39,0	40,8	40,8	37,8			70.59.39,10	G.
	(f) 33 Scorpii.....	119.40	1.33,1	33,5	32,2	34,8	32,2	32,7			119.41.32,30	G.
	ρ Herculis.....	58.20	1.52,4	52,1	52,0	53,0	51,9	52,2	12,310	- 0,60	58.21.52,05	G.
	* R. 17 <sup>h</sup> . 26 <sup>m</sup> . 7 <sup>s</sup> ..	60.40	3.13,5	12,8	13,5	13,5	13,5	11,8			60.43.12,73	G.
	79 Herculis.....	71.10	4.54,0	52,0	54,3	53,8	55,8	50,4			71.14.52,82	G.
	Capella R. M.....	217.0	4.45,1	42,0	42,4	44,4	42,9	41,9	12,310	- 46,02	217.3.56,55	G.
	Capella.....	49.45	5.5,2	6,2	4,9	6,0	6,8	1,9			49.50.4,57	G.
	Mercury, center...	72.25	0.25,5	26,1	25,6	28,6	26,0	26,8			72.25.26,38	G.
	☉ S.L. M.....	72.25	3.25,8	27,2	26,0	28,1	29,8	24,5	11,360	- 26,18	72.28.0,32	G.
	☉ N.L.....	71.55	1.27,8	28,5	27,8	30,9	28,9	28,2			71.56.28,52	G.
	(g) Venus N.L.....	76.5	3.16,5	17,4	16,4	20,0	19,2	16,0			76.8.17,20	G.
	α Ursæ Maj. R. M.....	233.50	2.16,2	12,1	13,8	16,3	13,5	15,4	12,924	- 58,85	233.51.15,45	G.
	α Ursæ Majoris...	33.0	2.45,9	47,4	45,2	47,2	50,0	45,8			33.2.46,60	G.

Coincidences at the five wires taken June 20, 0<sup>h</sup> 1/2.

- (a) At the five wires; cloudy and faint, particularly at the middle wire. No correction for runs.  
 (b) Came on the fixed wire but not well bisected.  
 (c) Dancing exceedingly.

- (d) At the 3rd, 4th and 5th wires.  
 (e) Cloudy.  
 (f) At the comb.  
 (g) Very unsteady and badly defined.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N.P.D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	° ' "	Inch.	°	°	' "	' "	"	' "	° ' "	
59,88	19.23.33,06	30,100	53,2	49,2	20,69				57.11.2,03	*R.17 <sup>h</sup> .18 <sup>m</sup> .40 <sup>s</sup>
	17.16.11,11		52,4	48,9	18,29				55.3.37,68	*R.17 <sup>h</sup> .26 <sup>m</sup> .7 <sup>s</sup> .
	27.47.53,16				31,00				65.35.32,44	79 Herculis.
	30.8.18,08	30,140	67,2	65,5	33,06	3,45			67.55.55,97	Mercury.
	6.23.5,49				6,37				44.10.20,14	Capella R.
	6.23.3,30								44.10.17,95	Capella.
	28.33.23,53	30,122	64,5	67,6	30,84	4,00		15.45,60	66.36.44,25	☉.
	29.4.52,10				31,52	4,07			66.36.41,23	☉.
	31.43.43,98	30,094	63,5	68,8	34,92	4,41	9,253	8,98	69.31.31,75	Venus.
	45.3.9,45	30,060	63,7	66,8					82.27.21,87	☾.
61,69	45.3.9,00								82.27.21,42	☾.
	45.3.9,57				56,70	38.57,01		15.4,45	82.27.21,99	☾.
	45.3.8,90								82.27.21,32	☾.
	45.3.7,84								82.27.20,26	☾.
	50.1.13,21			65,5	1.7,63	5,41			87.49.23,71	Mars.
	54.29.49,30			65,0	1.19,52	1,36	8,338	18,44	92.18.34,18	Jupiter.
	-39.19.27,86				46,55				-1.33.6,13	Polaris SP. R.
	-39.19.26,42								-1.33.4,69	Polaris SP.
	29.43.13,30	29,950	67,4	69,5	32,05	3,37			67.30.50,26	Mercury.
	6.23.3,53				6,28				44.10.18,09	Capella R.
60,67	6.23.2,93								44.10.17,49	Capella.
	29.3.10,17	29,948	67,5	71,8	31,04	4,07		15.45,50	66.34.59,92	☉.
	28.31.41,23				30,38	4,00			66.35.1,39	☉.
	56.54.55,05	29,978	67,4	67,3					94.12.55,61	☾.
	56.54.54,35				1.26,40	45.23,38		14.49,26	94.12.54,91	☾.
	56.54.53,62								94.12.55,18	☾.
	54.32.5,46				1.19,05	1,35	8,288	18,97	92.20.50,41	Jupiter.
	-39.19.25,80			66,6	46,27				-1.33.3,79	Polaris SP. R.
	-39.19.27,39								-1.33.5,38	Polaris SP.
	62.30.26,84				1.48,13				100.19.23,25	Spica R.
60,93	62.30.26,75								100.19.23,16	Spica.
	2.5.42,23	29,992	66,6	65,6					39.52.52,59	η Ursæ Maj. R.
	2.5.40,25				2,08				39.52.50,61	η Ursæ Majoris.
	32.59.54,47				36,78				70.47.39,53	η Bootis R.
	32.59.54,96								70.47.40,02	η Bootis.
	71.30.9,26	30,034	62,7	60,0	2.49,70	0,89	9,285	8,56	109.20.14,91	Saturn.
	51.38.36,26	30,040	61,4	59,5	1.12,47				89.26.57,01	*R.17 <sup>h</sup> .4 <sup>m</sup> .40 <sup>s</sup> .
	84.26.20,41				8.53,04				122.22.21,73	A.S.C. 1972.
	23.12.50,26				24,64				61.0.23,18	*R.17 <sup>h</sup> .12 <sup>m</sup> .30 <sup>s</sup>
	27.32.38,13				29,96				65.20.16,37	α Herculis.
60,56	76.14.31,33				3.50,12				114.5.29,73	33 Scorpil.
	14.54.51,08				15,30				52.42.14,66	ρ Herculis.
	17.16.11,76				17,86				55.3.37,90	*R.17 <sup>h</sup> .26 <sup>m</sup> .7 <sup>s</sup> .
	27.47.51,85			58,3	30,35				65.35.30,48	79 Herculis.
	6.23.4,42	30,044	70,4	69,0	6,31				44.10.19,01	Capella R.
	6.23.3,60								44.10.18,19	Capella.
	28.58.25,41			69,4	31,19	3,22			66.46.1,66	Mercury.
	29.0.59,35	30,024	68,2	70,1	31,18	4,06		15.45,40	66.32.49,35	☉.
	28.29.27,55				30,51	3,99			66.32.47,75	☉.
	32.41.16,23	29,960	67,0	70,2	35,98	4,64	9,210	9,44	70.29.5,29	Venus.
61,03	-10.24.14,48	29,932		68,7	10,32				27.22.43,48	α Ursæ Maj. R.
	-10.24.14,37								27.22.43,59	α Ursæ Majoris.

Coincidence of Micrometer Wire with fixed Wire = 10',105 at the middle Wire. From June 17 = 10',098, 10',100, 10',105, 10',105, 10',111 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = - 3'',5.

Adopted Zenith Point = 43°.27'.0'',97.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.	Microscopes.						Micrometer, or Time by Molyneux.	Correction for Microm. or Time.	Concluded reading of Circle.	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
June 20	Capella R. M. ....	217. 5	0. 17,0	16,2	16,8	19,4	16,0	18,0	13,990	-1. 21,09	217. 3. 56,11	G.
	Capella .....	49. 50	0. 5,1	4,5	5,7	8,2	4,9	6,4			49. 50. 5,78	G.
	Mercury, center...	72. 5	1. 7,0	6,6	8,2	10,0	7,8	7,0			72. 6. 7,63	G.
June 21	☉ N.L. M. ....	71. 55	1. 11,7	12,0	11,8	14,3	12,1	11,7	10,582	- 9,96	71. 56. 2,17	G.
	☉ S.L. ....	72. 25	2. 31,1	31,1	29,5	32,2	31,5	29,8			72. 27. 30,58	G.
June 22	Jupiter S.L. ....	98. 0	3. 41,0	36,4	39,3	38,8	37,9	36,8	11,127	- 21,33	98. 3. 38,12	G.
	δ Ursæ Min. R. M.	257. 45	4. 13,2	10,3	12,3	13,2	9,8	10,7			257. 48. 49,95	G.
	δ Ursæ Minoris ...	9. 5	0. 14,9	11,8	14,1	16,0	11,1	15,3			9. 5. 13,85	G.
	α Lyræ R. M. ....	209. 50	3. 20,0	18,8	20,6	22,8	18,0	18,4	12,380	- 47,48	209. 52. 32,05	G.
	α Lyræ .....	57. 0	1. 33,4	29,9	31,3	32,7	30,0	32,5			57. 1. 31,53	G.
June 24	(a) ☉ S.L. M. ....	72. 25	3. 18,4	17,7	17,4	18,8	17,8	17,0	9,340	+ 15,96	72. 28. 33,58	G.
	☉ N.L. ....	71. 55	2. 7,0	4,0	5,0	7,9	4,2	4,1			71. 57. 5,22	G.
	Mars, center .....	94. 50	4. 10,6	10,2	11,5	13,4	11,6	10,3			94. 54. 10,97	C.
	(b) Jupiter N.L. ....	98. 5	0. 58,2	57,8	58,3	60,2	57,2	58,7	- 0,06		98. 5. 57,99	C.
	(c) Saturn N.L. ....	114. 50	4. 34,1	36,5	35,9	38,2	33,6	38,7			114. 54. 36,20	C.
	(d) S.L. ....	123. 20	2. 3,8	2,8	3,6	5,5	2,8	3,8			123. 22. 3,57	C.
	☉ S.L. M. ....	123. 20	2. 3,8	2,8	3,6	5,5	2,8	3,8	9,897	+ 4,46 - 3,44	123. 22. 4,59	C.
	☉ S.L. ....	71. 55	3. 12,9	11,1	12,2	13,0	12,7	9,7	9,992	+ 2,36	71. 58. 14,08	G.
	☉ S.L. ....	72. 25	4. 42,8	41,3	42,0	41,9	42,3	39,2			72. 29. 41,25	G.
	(e) Jupiter S.L. ....	98. 5	3. 7,1	6,2	6,7	9,5	7,8	5,8			98. 8. 6,97	G.
June 28	☉ S.L. M. ....	72. 35	1. 37,2	37,4	37,1	39,3	36,8	37,5	12,827	- 56,80	72. 35. 40,63	G.
	☉ N.L. ....	72. 0	4. 15,0	13,0	14,0	15,2	13,2	10,8			72. 4. 13,23	G.
July 1	(f) Venus N.L. ....	80. 10	1. 5,9	5,1	6,8	5,0	6,0	5,0			80. 11. 5,42	G.
	(a) Saturn N.L. ....	114. 50	1. 21,3	22,5	21,5	22,5	21,5	22,5			114. 51. 21,70	C.
July 3	(g) ☉ N.L. ....	72. 20	2. 17,0	20,2	17,2	17,1	20,1	16,0	11,330	- 0,53	72. 22. 17,47	G.
	(h) Venus N.L. ....	80. 55	4. 48,9	51,3	47,8	48,3	51,2	46,8			80. 59. 47,54	G.
	* R. 18 <sup>h</sup> . 0 <sup>m</sup> . 30 <sup>s</sup> .	49. 55	3. 18,8	20,8	17,2	16,0	20,2	17,8			49. 58. 17,80	G.
	δ Ursæ Min. R. M.	257. 45	4. 17,8	20,1	17,2	17,0	18,3	19,2			257. 48. 51,86	G.
	δ Ursæ Minoris ...	9. 0	5. 10,0	13,2	11,8	7,8	12,2	9,9			9. 5. 9,77	G.
	(i) * R. 18 <sup>h</sup> . 27 <sup>m</sup> . 20 <sup>s</sup> .	112. 55	2. 16,8	20,9	17,1	17,8	19,0	16,7	11,429	- 27,61 + 0,10	112. 57. 17,58	G.
	* R. 18 <sup>h</sup> . 30 <sup>m</sup> . 47 <sup>s</sup> .	44. 0	0. 32,0	34,9	31,5	31,8	34,5	33,0			44. 0. 32,83	G.
	β Lyræ R. M. ....	204. 25	0. 37,2	40,0	37,0	37,9	39,0	38,8			204. 25. 10,59	G.
	(k) β Lyræ .....	62. 25	3. 48,8	51,3	49,0	46,2	50,3	48,8			62. 28. 48,40	G.
	* R. 18 <sup>h</sup> . 48 <sup>m</sup> . 20 <sup>s</sup> .	93. 20	2. 39,8	41,0	40,0	40,1	42,0	40,0			93. 22. 39,93	G.
	S Sagittarii .....	126. 45	3. 39,6	44,0	40,4	40,9	42,3	40,2	9,903	+ 4,23 - 0,01 + 0,12	126. 48. 40,48	G.
	A.S.C. 2212 .....	124. 25	1. 40,1	43,3	41,2	42,1	43,3	41,4			124. 26. 41,55	G.
	O Sagittarii .....	125. 35	1. 28,3	30,9	28,9	29,5	31,1	29,2			125. 36. 29,35	G.
	(l) ☉ S.L. M. ....	72. 55	3. 31,3	35,0	30,3	31,9	36,4	31,0			72. 58. 36,15	G.
	☉ N.L. ....	72. 25	2. 6,0	8,5	7,0	6,2	10,1	3,9			72. 27. 6,64	G.
	Mercury, center...	71. 55	0. 20,3	23,0	20,9	22,8	25,9	19,9	12,587	- 51,79	71. 55. 22,07	G.
	Mars, center .....	97. 0	3. 41,9	43,8	41,3	43,2	46,0	41,4			97. 3. 42,18	G.
	(e) Jupiter S.L. ....	98. 20	2. 49,8	53,1	50,5	51,0	54,9	48,8			98. 24. 50,37	G.
	Polaris SP. R. M.	262. 45	2. 19,1	17,3	18,2	17,0	20,5	19,3			262. 46. 26,31	G.
	Polaris SP. ....	4. 5	2. 34,8	34,4	33,9	32,4	38,9	34,3			4. 7. 34,27	G.
July 4	Spica R. M. ....	160. 55	2. 25,8	27,8	23,0	25,0	29,6	26,7	12,603	- 52,13	160. 56. 33,70	G.
	Spica. ....	105. 55	2. 27,8	28,2	25,3	25,9	29,9	25,3			105. 57. 26,57	G.
	(m) Saturn S.L. ....	114. 50	0. 31,1	32,2	28,9	30,8	35,8	31,1	5,530	+ 1. 35,52	114. 50. 31,55	G.
	Venus N.L. ....	81. 45	4. 38,9	39,4	39,0	37,5	42,0	36,9			81. 49. 38,02	G.
	Mars, center .....	97. 15	2. 0,8	3,1	2,3	2,4	4,8	0,0			97. 17. 1,83	G.
	Arcturus R. M. ....	191. 10	4. 29,0	29,9	28,0	27,9	32,9	28,7			191. 16. 4,00	G.
July 5	Arcturus .....	75. 35	2. 57,8	57,0	57,0	54,8	60,0	55,9			75. 37. 56,50	G.

Runs taken June 25, 1<sup>h</sup>. (Temp. 65°.) Coincidence at middle wire and Runs taken July 3, 23<sup>h</sup>. (Temp. 64°.)

(a) Cloudy. (b) At the 5th wire; S.L. unsatisfactory. Correction for change of N.P.D. = -0".04. (c) Small correction for runs on the negative side. (d) At the 3rd and 5th wires; rough limb and cloudy. (e) Very faint and unsatisfactory. (f) Before this observation the circle was taken from the wall, the axis and divisions were cleaned, and the microscopes adjusted: at the same time the runs of microscopes E and F were lessened. (g) The microscopes were read off previous to the observation and the limb came on the fixed wire. (h) At the comb; very faint. Correction for change of N.P.D. = -0".88. (i) About the 8th magnitude. (k) At the 4th wire. (l) At the 4th and 5th wires; too cloudy for dark glass. Corrections for change of N.P.D. = -0".07, and -0".13 respectively. (m) Very cloudy.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
60,95	6.23. 4,86	29,710	69,7	67,0	6,26					Capella R. Capella. Mercury.
	6.23. 4,81									
	28.39. 6,66									
	28.29. 1,20	29,716	68,4	68,8	30,26			15.45,40	66.32.21,15 66.32.19,36	☉. ☉.
	29. 0.29,61									
61,90	54.36.37,15	29,318	61,8	61,0	1.18,52	1,34	11,800	17,69	92.24.44,92 3.24.40,75 3.24.42,61	Jupiter. δ Ursæ Min. R. δ Ursæ Minoris.
	-34.21.48,98	29,272	57,0	55,8	38,55				51.21.50,82 51.21.52,46	α Lyræ R. α Lyræ.
	-34.21.47,12									
61,79	13.34.28,92				13,62					
	13.34.30,56									
	29. 1.32,61	29,728	63,5	62,9	31,33	4,06		15.45,30	66.33.22,86 66.33.24,49	☉. ☉.
	28.30. 4,25				30,66	4,00			89.15.23,70 92.27.40,11	Mars. Jupiter.
	51.27.10,00	29,760	64,3	63,6	1.10,72	5,30			109.17.39,60 116.38.28,74	Saturn. ♃.
	54.38.57,02		62,7	62,3	1.19,60	1,33	8,526	16,54		
	71.27.35,23	29,792	58,8	57,7	2.48,71	0,89	9,313	8,27	116.38.28,74 116.38.29,76	♃. ♃.
	79.55. 2,60				5.10,43	53.55,05		14.57,52		
	79.55. 3,62									
	28.31.13,11	29,868	64,2	64,3	30,74	4,00		15.45,20	66.34.33,33 66.34.30,71	☉. ☉.
	29. 2.40,28				31,41	4,06			92.29.14,19	Jupiter.
	54.41. 6,00	29,800	65,2	65,2	1.19,35	1,33	11,840	18,11		
	29. 8.39,66	29,590	62,0	63,2	31,32	4,08		15.45,10	66.40.30,08 66.40.32,28	☉. ☉.
	28.37.12,26				30,65	4,01				
	36.44. 4,78	30,222	57,0	58,2	43,22	5,63	9,233	9,30	74.31.59,95 109.14.29,90	Venus. Saturn.
	71.24.21,06	30,220	53,8	52,4	2.52,46	0,88	9,246	8,98		
	28.55.16,83	30,210	59,4	60,6	31,84	4,05		15.45,10	66.58.38,00 75.20.42,59	☉. Venus.
	37.32.46,90	30,186	61,0	63,1	44,03	5,84	9,248	9,22	44.18.32,07 3.24.37,42	*R.18 <sup>h</sup> .0 <sup>m</sup> .30 <sup>s</sup> . δ Ursæ Min. R.
	6.31.17,16	30,150	58,0	56,9	6,63				3.24.37,77 107.19.59,06	δ Ursæ Minoris. *R.18 <sup>h</sup> .27 <sup>m</sup> .20 <sup>s</sup>
60,82	-34.21.51,22			56,6	39,64				38.20.41,06 56.49.18,34	*R.18 <sup>h</sup> .30 <sup>m</sup> .47 <sup>s</sup> . β Lyræ R.
	-34.21.50,87								56.49.16,05 87.43.56,40	β Lyræ. *R.18 <sup>h</sup> .48 <sup>m</sup> .20 <sup>s</sup>
	69.30.16,94				2.33,84				121.16.30,51 118.52.39,56	S Sagittarii. A.S.C. 2212.
	0.33.32,19				0,59				120. 3.15,13	O Sagittarii.
	19. 1.50,05				20,01					
	19. 1.47,76				1. 8,83					
59,50	49.55.39,29				7.42,39					
	83.21.39,84	30,144	57,8	56,5	5.50,37					
	80.59.40,91				6.38,14					
	82. 9.28,71									
	29.31.35,51	30,130	63,8	64,6	32,30	4,13		15.45,10	67. 3.26,86 67. 3.26,93	☉. ☉.
	29. 0. 6,00				31,61	4,06			66.15.57,44 91.25. 1,44	Mercury. Mars.
	28.28.21,43				30,84	3,11			92.45.59,43 -1.33. 3,86	Jupiter. Polaris SP. R.
60,29	53.36.41,54	30,100	66,0	67,0	1.16,79	5,17	11,828	17,97	-1.33. 4,56 100.19.23,81	Polaris SP. Spica R.
	54.57.49,73				1.20,69	1,30			100.19.22,80 109.13.18,67	Spica. Saturn.
	-39.19.25,67			66,5	46,47					
60,14	-39.19.26,37									
	62.30.26,94				1.48,59					
	62.30.25,93									
	71.23.30,91	30,120	60,9	58,6	2.49,59	0,88	10,990	9,23	76.10.34,57 91.38.21,75	Venus. Mars.
	38.22.37,38	30,058	62,3	63,7	45,11	6,06	9,183	9,86	69.58.40,71 69.58.39,93	Arcturus R. Arcturus.
	53.50. 1,19	30,038	65,3	65,8	1.17,43	5,15				
60,25	32.10.56,64	30,016	64,2	64,0	35,79					
	32.10.55,86									

Coincidence of Micrometer Wire with fixed Wire = 10', 105, at the middle wire. From June 28 = 10', 106.

One Micrometer Revolution = 20'', 873.

Correction for Runs = - 3'', 5. From June 22 = - 2'', 1. From July 1 = - 6'', 1.

Adopted Zenith Point = 43°. 27'. 0'', 97. From July 1 = 43°. 27'. 0'', 64.

Assumed Co-latitude = 37°. 47'. 8'', 28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  h m s.	Correction for Microm. or Time.  ' "	Concluded reading of Circle.  ° ' "	Observer.		
			A	B	C	D	E	F						
			° ' "	° ' "	° ' "	° ' "	° ' "	° ' "						
July 5	(a) Saturn N.L.....	114.45	4.53,1	58,5	54,4	54,4	55,8	53,8	10,269	- 3,40	114.49.54,00	G.		
	(b) α Herculis R. M...	185.45	4.33,4	34,9	31,3	32,8	35,3	34,8			185.49.29,42	G.		
	α Herculis.....	81.0	4.29,0	32,1	27,5	27,9	31,2	29,6			81.4.28,63	G.		
	* R. 17 <sup>h</sup> .18 <sup>m</sup> .41 <sup>s</sup> .	62.50	0.26,9	28,3	25,9	25,8	29,9	28,1			62.50.27,40	G.		
	A.S.C. 2042. M....	127.10	0.26,9	29,9	26,8	27,3	29,8	27,3	10,351	- 5,10	127.10.22,82	G.		
	A.S.C. 2044.....	126.5	0.2,2	6,0	4,4	3,8	6,3	3,8			126.5.4,40	G.		
	* R. 17 <sup>h</sup> .46 <sup>m</sup> .81 <sup>s</sup> .	53.55	0.37,8	40,9	36,4	36,1	40,0	37,8			53.55.38,05	G.		
	θ Herculis.....	58.20	3.6,9	10,1	7,0	4,1	10,0	6,8			58.23.6,85	G.		
	γ Draconis.....	44.5	4.17,3	20,8	17,3	13,7	20,8	17,3	10,890	- 16,36	44.9.17,00	G.		
	* R.18 <sup>h</sup> .0 <sup>m</sup> .30 <sup>s</sup> . M.	49.55	3.34,3	37,0	32,1	31,2	39,2	34,9			49.58.17,69	G.		
	α Lyncis SP. R. M.	289.40	2.14,5	17,2	13,0	13,3	17,4	15,5		20,868	-3.44,63	289.38.30,05	G.	
	α Lyncis SP.....	337.15	0.30,5	30,5	29,8	30,3	36,9	33,8			337.15.31,87	G.		
	δ Ursæ Min. R. M.	257.50	0.30,3	33,3	29,4	31,2	34,1	33,1	14,875	-1.39,54	257.48.52,26	G.		
	δ Ursæ Minoris...	9.5	0.10,4	9,0	9,6	8,2	12,3	9,3		9.5.9,77	G.			
	* R. 18 <sup>h</sup> .27 <sup>m</sup> .20 <sup>s</sup> .	112.55	2.19,0	22,2	18,4	18,2	23,4	18,9		112.57.19,55	G.			
	* R. 18 <sup>h</sup> .30 <sup>m</sup> .47 <sup>s</sup> .	44.0	0.32,7	36,0	31,7	30,9	35,9	32,8		44.0.33,23	G.			
	β Lyræ R. M.....	204.25	0.27,4	32,1	27,0	29,0	31,2	29,4	10,954	- 17,70	204.25.11,55	G.		
	(c) β Lyræ.....	62.25	3.48,8	51,2	48,2	45,3	50,8	47,4		+ 0,40	62.28.48,25	G.		
	(d) β <sup>2</sup> Lyræ R. M....	204.25	0.27,4	32,1	27,0	29,0	31,2	29,4		12,787	- 55,96	204.24.33,29	G.	
	(c) β <sup>2</sup> Lyræ M.....	62.25	3.48,8	51,2	48,2	45,3	50,8	47,4		8,246	+ 38,95 + 0,40	62.29.27,20	G.	
	* R. 18 <sup>h</sup> .48 <sup>m</sup> .20 <sup>s</sup> .	93.20	2.40,1	42,9	39,7	39,8	43,5	40,1	10,965	- 17,93	93.22.40,47	G.		
	S Sagittarii.....	126.45	3.43,5	46,8	44,8	44,1	49,5	44,0			126.48.44,70	G.		
	A.S.C. 2212.....	124.25	1.46,2	49,8	45,8	45,8	49,5	45,2			124.26.46,68	G.		
	Capella R. M.....	217.0	4.14,2	13,0	11,8	11,4	14,9	12,6			217.3.54,20	G.		
	Capella.....	49.45	5.6,4	7,9	4,9	4,0	10,5	3,8			49.50.5,22	G.		
July 6	(e) ⊙ S.L. M.....	73.5	4.9,1	15,0	11,6	9,9	16,8	8,4			9,130	+ 20,38	73.9.31,33	G.
	⊙ N.L. ....	72.35	2.58,9	64,1	60,4	58,3	64,4	56,2	72.37.59,77	G.				
	Mercury, center...	72.30	2.20,7	24,0	20,4	20,0	25,5	18,9	72.32.21,12	G.				
	(f) Venus N.L.....	82.10	4.57,2	59,0	57,4	58,4	60,2	56,0	82.14.58,03	G.				
	Saturn N.L.....	114.45	4.37,3	36,3	33,7	34,6	37,7	35,5	114.49.34,92	C.				
July 10	(g) ⊙ S.L. M.....	73.35	2.18,8	20,9	18,8	17,2	18,9	15,4	13,899	-1.19,17	73.35.58,78	C.		
	⊙ N.L.....	73.0	4.31,5	32,7	30,4	27,9	32,1	27,9			73.4.29,65	C.		
July 11	⊙ N.L. M.....	73.10	2.15,0	16,8	13,2	12,4	16,3	10,2	10,510	- 8,50	73.12.5,10	G.		
	⊙ S.L. ....	73.40	3.34,9	36,6	34,0	32,8	36,7	32,7			73.43.34,00	G.		
	(h) Venus N.L.....	84.25	0.16,2	18,0	15,2	16,2	19,5	15,2		- 0,51	84.25.16,16	G.		
	(i) Mars, center.....	98.35	3.17,6	20,6	15,7	15,2	19,9	15,0		- 0,35	98.38.16,42	G.		
	(k) Jupiter N.L.....	98.40	0.34,6	37,9	34,0	35,8	38,0	34,3		- 0,09	98.40.35,58	G.		
	Polaris SP. R. M..	262.45	2.20,5	20,8	18,4	19,8	22,0	20,5		12,672	- 53,63	262.46.26,32	G.	
	Polaris SP. ....	4.5	2.36,2	35,6	33,0	33,0	39,0	34,5			4.7.34,78	G.		
July 13	(l) ⊙ N.L. M.....	73.25	3.19,0	25,0	20,8	18,5	25,4	16,8	9,928	+ 3,65	73.28.24,00	G.		
	⊙ S.L. ....	73.55	4.53,4	57,0	55,3	50,2	58,8	49,7			73.59.53,23	G.		
	Mercury, center...	75.35	1.59,8	63,2	60,0	59,9	62,8	57,3			75.37.0,17	G.		
	Venus N.L.....	85.15	3.50,8	54,4	49,4	50,5	53,7	48,4			85.18.50,53	G.		
	Jupiter N.L.....	98.45	0.45,6	50,8	45,0	47,4	49,2	43,4			98.45.46,77	G.		
July 15	⊙ N.L. M.....	73.45	1.20,3	23,8	20,3	20,0	22,8	17,9	10,424	- 6,70	73.46.13,93	G.		
	⊙ S.L. ....	74.15	2.44,8	46,0	44,0	43,8	46,9	42,2			74.17.44,15	G.		
	Mercury, center..	76.40	1.9,0	11,0	7,8	10,0	10,8	6,1			76.41.8,92	G.		
	Venus N.L.....	86.10	3.4,0	8,4	3,8	4,5	7,6	1,2			86.13.4,38	G.		
	(m) ⊙ N.L. M.....	92.5	3.21,8	24,0	19,6	20,4	23,8	18,2		9,972	+ 8,28 + 2,68 + 4,14	92.8.29,01	G.	
	⊙ N.L. M.....	92.5	3.21,8	24,0	19,6	20,4	23,8	18,2			92.8.27,55	G.		
	⊙ N.L. M.....	92.5	3.21,8	24,0	19,6	20,4	23,8	18,2			92.8.27,51	G.		
	Mars, center.....	99.30	3.26,4	30,0	25,0	26,3	29,9	24,8	9,778	+ 6,78	99.33.26,48	G.		
	Jupiter N.L.....	98.50	1.6,8	11,6	7,4	8,0	9,5	4,8			98.51.7,82	G.		
	λ Ursæ Min. R. M.	260.5	0.23,5	24,1	21,1	24,0	21,9	22,0			17,124	-2.26,55	260.2.56,15	G.
	λ Ursæ Minoris...	6.50	1.11,4	10,0	10,0	7,7	7,7	8,8				6.51.9,07	G.	

Coincidences at the five wires and Runs taken July 17, 1<sup>h</sup>. (Temp. 69°).

(a) Very cloudy. (b) Not good, too much wind. (c) At the 5th wire. (d) β Lyræ's companion.  
 (e) Misty. (f) No correction for runs. (g) Hurried. (h) At the 5th wire. Correction for change of  
 N.P.D. = -0''.63. (i) At the 5th wire. Correction for change of N.P.D. = -0''.32. (k) At the 5th wire;  
 faint. Correction for change of N.P.D. = -0''.06. (l) Very much waving. The circle had been protected  
 from the Sun's rays but a short interval before the observation. (m) At the 1st, 2nd and 3rd wires.



Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N.P.D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
59,03	71.22.53,36	30,004	61,7	60,3	2.48,26	0,88	9,263	8,80	109.12.57,82	Saturn.
	37.37.31,22	29,996	60,5	59,4	44,20				75.25.23,70	$\alpha$ Herculis R.
	37.37.27,99				20,19				75.25.20,47	$\alpha$ Herculis.
	19.23.26,76				8.1,49				57.10.55,23	* $\mathcal{R}$ .17 <sup>h</sup> .18 <sup>m</sup> .41 <sup>s</sup> .
	83.43.22,18	29,982	59,8	57,8	6.58,05				121.38.31,95	A.S.C. 2042.
	82.38.3,76				10,64				120.32.10,09	A.S.C. 2044.
	10.28.37,41				15,35				48.15.56,33	* $\mathcal{R}$ .17 <sup>h</sup> .46 <sup>m</sup> .31 <sup>s</sup> .
	14.56.6,21				0,71				52.43.29,84	$\theta$ Herculis.
	0.42.16,36				6,58				38.29.25,35	$\gamma$ Draconis.
	6.31.17,05				2.9,60				44.18.31,91	* $\mathcal{R}$ .18 <sup>h</sup> .0 <sup>m</sup> .30 <sup>s</sup> .
60,96	-66.11.29,41								-28.26.30,73	$\alpha$ Lynceis SP. R.
	-66.11.28,77								-28.26.30,09	$\alpha$ Lynceis SP.
61,02	-34.21.51,62				39,32				3.24.37,34	$\delta$ Ursæ Min. R.
	-34.21.50,87				2.32,62				3.24.38,09	$\delta$ Ursæ Minoris.
	69.30.18,91				0,56				107.19.59,81	* $\mathcal{R}$ .18 <sup>h</sup> .27 <sup>m</sup> .20 <sup>s</sup> .
	0.33.32,59				19,85				38.20.41,43	* $\mathcal{R}$ .18 <sup>h</sup> .30 <sup>m</sup> .47 <sup>s</sup> .
59,90	19.1.49,09	29,960	58,7	57,4					56.49.17,22	$\beta$ Lyræ R.
	19.1.47,61				19,86				56.49.15,74	$\beta$ Lyræ.
	19.2.27,35								56.49.55,49	$\beta^2$ Lyræ R.
60,25	19.2.26,56								56.49.54,70	$\beta^2$ Lyræ.
	49.55.39,83				1.8,29				87.43.56,40	* $\mathcal{R}$ .18 <sup>h</sup> .48 <sup>m</sup> .20 <sup>s</sup> .
	83.21.44,06				7.38,75				121.16.31,09	S Sagittarii.
	80.59.46,04				5.47,60				118.52.41,92	A.S.C. 2212.
59,71	6.23.6,44	30,110	65,0	65,7	6,36				44.10.21,08	Capella R.
	6.23.4,58								44.10.19,22	Capella.
	29.42.30,69	29,890	68,7	70,3	31,92	4,15		15.45,10	67.14.21,64	$\odot$ .
	29.10.59,13				31,24	4,08			67.14.19,67	$\odot$ .
	29.5.20,48	29,874	69,2	71,4	31,04	3,20			66.52.56,60	Mercury.
	38.47.57,39	29,852	72,6	73,7	44,60	6,17	9,107	10,70	76.35.54,80	Venus.
	71.22.34,28	29,802	64,2	62,1	2.46,48	0,88	9,260	8,83	109.12.36,99	Saturn.
	30.8.58,14	29,880	62,4	64,3	32,87	4,21		15.45,20	67.40.49,88	$\odot$ .
	29.37.29,01				32,18	4,14			67.40.50,53	$\odot$ .
	29.45.4,46	29,882	68,6	69,2	32,03	4,16		15.45,20	67.48.25,81	$\odot$ .
	30.16.33,36				32,72	4,22			67.48.24,94	$\odot$ .
	40.58.15,52	29,850	70,2	70,9	48,43	6,77	9,111	10,71	78.46.16,17	Venus.
	55.11.15,78	29,836	69,7	69,8	1.20,20	5,09			92.59.39,17	Mars.
	55.13.34,94				1.20,31	1,28	8,494	16,84	93.2.19,09	Jupiter.
60,55	-39.19.25,68	29,828	69,0	68,3	45,89				-1.33.3,29	Polaris SP. R.
	-39.19.25,86								-1.33.3,47	Polaris SP.
	30.1.23,36	30,050	66,0	67,5	32,68	4,19		15.45,30	68.4.45,43	$\odot$ .
	30.32.52,59				33,37	4,26			68.4.44,68	$\odot$ .
	32.9.59,53		66,6	68,0	35,52	3,72			69.57.39,61	Mercury.
	41.51.49,89	30,058	67,4	69,0	50,50	7,03	9,085	10,96	79.39.52,60	Venus.
	55.18.46,13		67,9	69,4	1.21,24	1,27	8,463	17,11	93.7.31,49	Jupiter.
	30.19.13,29	29,930	65,0	65,7	33,06	4,23		15.45,40	68.22.35,80	$\odot$ .
	30.50.43,51				33,75	4,30			68.22.35,84	$\odot$ .
	33.14.8,28		65,8	67,8	36,88	3,91			71.1.49,53	Mercury.
	42.46.3,74	29,966	66,0	66,2	52,26	7,30	9,079	11,03	80.34.8,01	Venus.
	48.41.28,37			66,8					86.3.24,29	$\gg$ .
	48.41.26,91				1.4,17	41.20,74		15.4,21	86.3.22,83	$\gg$ .
	48.41.26,87								86.3.22,79	$\gg$ .
	56.6.25,84	29,988	65,3	64,3	1.24,33	5,04			93.54.53,41	Mars.
	55.24.7,18				1.22,15	1,27	8,550	16,21	93.12.52,55	Jupiter.
62,61	-36.35.55,51	30,050	55,0	52,7	43,25				1.10.29,52	$\lambda$ Ursæ Min. R.
	-36.35.51,57								1.10.33,46	$\lambda$ Ursæ Minoris

Coincidence of Micrometer Wire with fixed Wire = 10',106, at the middle wire. From July 11 = 10',094, 10',100, 10',103, 10',104, 10',108 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = -6'',1. From July 10 = -5'',1.

Adopted Zenith Point = 43°.27'.0'',64.

Assumed Co-latitude 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer. ° ' "	Microscopes.						Micrometer, or Time by Molyneux. h. m. s.	Correction for Microm. or Time. ' "	Concluded reading of Circle. ° ' "	Observer.
			A	B	C	D	E	F				
			° ' "	° ' "	° ' "	° ' "	° ' "	° ' "				
July 15	(a) $\theta$ Cephei.....	33.10	2.54,0	53,2	51,2	49,8	50,8	50,9				
	$\alpha$ Cygni R. M....	215.55	2.21,0	22,3	18,1	19,5	17,8	18,9	11,707	+1,15	33.12.52,32	G.
	$\alpha$ Cygni.....	50.55	2.20,1	20,5	17,5	16,3	16,4	16,3		-33,47	215.56.45,75	G.
	* $\mathcal{R}$ . 21 <sup>h</sup> . 1 <sup>m</sup> . 50 <sup>s</sup> . M.	66.5	1.19,5	20,8	17,9	18,8	17,2	15,8	11,113	-21,08	50.57.17,47	G.
	* $\mathcal{R}$ . 21 <sup>h</sup> . 2 <sup>m</sup> . 22 <sup>s</sup> .	30.40	0.17,5	15,5	15,8	15,2	13,3	14,7			66.5.57,04	G.
	* $\mathcal{R}$ . 21 <sup>h</sup> . 2 <sup>m</sup> . 39 <sup>s</sup> . M.	30.40	0.17,5	15,5	15,8	15,2	13,3	14,7	4,600	+1.54,87	30.40.15,28	G.
	* $\mathcal{R}$ . 21 <sup>h</sup> . 9 <sup>m</sup> . 15 <sup>s</sup> .	82.20	1.60,3	59,7	59,0	58,0	58,1	56,1			30.42.10,15	G.
	(b) $\alpha$ Cephei R.....	233.5	3.17,2	18,0	13,7	15,1	14,2	15,1			82.21.58,20	G.
	$\alpha$ Cephei.....	33.45	0.50,0	49,5	47,9	46,9	46,1	46,8			233.8.14,98	G.
											33.45.47,73	G.
July 16	(c) $\odot$ S.L. M.....	74.25	3.17,9	21,0	18,0	15,2	19,2	14,9	13,205	-1.4,75	74.27.12,38	G.
	$\odot$ N.L.....	73.55	0.42,8	42,2	43,0	40,0	42,2	39,0			73.55.41,42	G.
	$\epsilon$ Ursæ Min. R. M.	253.30	2.13,6	14,8	13,0	13,4	11,8	12,5	13,499	-1.10,89	253.31.1,93	G.
	$\epsilon$ Ursæ Minoris...	13.20	2.58,5	60,5	58,0	57,2	60,5	55,5			13.22.57,87	G.
	* $\mathcal{R}$ . 17 <sup>h</sup> . 46 <sup>m</sup> . 8 <sup>s</sup> .	53.50	1.24,3	27,0	23,5	24,3	28,0	23,4			53.51.24,85	G.
	$\theta$ Herculis.....	58.20	3.4,2	7,0	5,5	3,2	8,2	2,4			58.23.4,55	G.
	$\gamma$ Draconis.....	44.5	4.15,0	16,5	14,9	11,7	17,0	12,1			44.9.13,82	G.
	* $\mathcal{R}$ . 18 <sup>h</sup> . 0 <sup>m</sup> . 30 <sup>s</sup> .	49.55	3.14,6	16,5	14,9	12,3	17,0	12,4			49.58.14,07	G.
	* $\mathcal{R}$ . 18 <sup>h</sup> . 27 <sup>m</sup> . 20 <sup>s</sup> .	112.55	2.20,0	24,2	21,3	20,2	24,3	19,0			112.57.21,10	G.
	$\alpha$ Lyræ R. M....	209.50	3.15,8	21,2	16,1	18,4	20,3	15,2	11,972	-39,01	209.52.38,26	G.
	$\alpha$ Lyræ.....	57.0	1.22,5	24,5	22,4	20,2	24,8	20,8			57.1.22,30	G.
	$\beta$ Lyræ R. M....	204.25	0.21,8	23,0	19,1	21,5	23,4	20,0	10,352	-5,19	204.25.16,23	G.
	(a) $\beta$ Lyræ.....	62.25	3.46,9	46,9	44,2	41,4	46,3	43,0		+0,40	62.28.44,55	G.
	* $\mathcal{R}$ . 18 <sup>h</sup> . 48 <sup>m</sup> . 20 <sup>s</sup> .	93.20	2.39,8	40,1	36,9	37,8	39,8	36,1			93.22.37,97	G.
	S Sagittarii.....	126.45	3.44,6	48,5	44,9	43,5	48,3	42,7			126.48.44,77	G.
	A.S.C. 2212.....	124.25	1.43,7	46,3	42,7	42,0	45,8	41,0			124.26.43,30	G.
	O Sagittarii.....	125.35	1.27,0	29,8	26,1	26,5	28,4	24,8			125.36.26,85	G.
July 17	$\odot$ N.L. M.....	74.5	1.24,3	28,0	25,0	24,5	27,1	23,0	12,682	-53,84	74.5.31,24	G.
	$\odot$ S.L.....	74.35	1.60,0	64,4	62,6	60,6	63,4	58,0			74.37.1,17	G.
	Mercury, center...	77.45	3.41,7	46,6	40,8	42,0	46,4	39,4			77.48.42,18	G.
July 18	(d) $\gg$ N.L.....	109.30	0.53,3	57,4	53,8	55,0	56,0	51,3		+7,40	109.31.1,72	G.
	$\gg$ N.L. M.....	109.30	0.53,3	57,4	53,8	55,0	56,0	51,3	9,958	+2,96	109.31.0,98	G.
	$\gg$ N.L. M.....	109.30	0.53,3	57,4	53,8	55,0	56,0	51,3		+3,70		
	$\gg$ N.L. M.....	109.30	0.53,3	57,4	53,8	55,0	56,0	51,3	9,808	+6,15	109.31.0,47	G.
	$\gg$ N.L. M.....	109.30	0.53,3	57,4	53,8	55,0	56,0	51,3	9,680	+8,85	109.30.59,47	G.
	$\gg$ N.L. M.....	109.30	0.53,3	57,4	53,3	55,0	56,0	51,3		-3,70		
	$\gg$ N.L. M.....	109.30	0.53,3	57,4	53,3	55,0	56,0	51,3	9,521	+12,26	109.30.59,18	G.
										-7,40		
	Saturn S.L.....	114.45	1.61,0	64,0	61,2	62,3	62,2	59,5			114.47.1,37	G.
	* $\mathcal{R}$ . 21 <sup>h</sup> . 2 <sup>m</sup> . 22 <sup>s</sup> .	30.40	0.14,8	17,0	14,6	14,5	13,5	12,9			30.40.14,52	G.
	* $\mathcal{R}$ . 21 <sup>h</sup> . 2 <sup>m</sup> . 39 <sup>s</sup> . M.	30.40	0.14,8	17,0	14,6	14,5	13,5	12,9	4,666	+1.53,50	30.42.8,02	G.
	* $\mathcal{R}$ . 21 <sup>h</sup> . 9 <sup>m</sup> . 15 <sup>s</sup> .	82.20	1.59,4	62,8	60,3	59,9	60,8	56,8			82.21.59,67	G.
July 21	$\alpha$ Cephei R. M....	233.5	2.23,8	26,0	21,2	23,2	24,1	23,3	7,534	+53,63	233.8.16,83	G.
	$\alpha$ Cephei.....	33.45	0.46,7	48,7	45,5	45,8	45,1	45,0			33.45.46,00	G.
	$\beta$ Cephei R. M....	241.5	0.36,9	38,4	33,7	35,9	36,6	36,0	11,572	-30,66	241.5.5,49	G.
	$\beta$ Cephei.....	25.45	3.59,4	59,8	58,0	56,0	57,6	55,4			25.48.57,03	G.
	(e) $\gg$ N.L. M.....	122.0	0.46,1	50,0	43,7	45,8	48,3	43,1	11,132	-21,67	122.0.28,50	G.
	$\gg$ N.L. M.....	122.0	0.46,1	50,0	43,7	45,8	48,3	43,1		+4,14		
	$\gg$ N.L. M.....	122.0	0.46,1	50,0	43,7	45,8	48,3	43,1	11,130	-21,50	122.0.26,60	G.
	$\gg$ N.L. M.....	122.0	0.46,1	50,0	43,7	45,8	48,3	43,1		+2,07		
	$\gg$ N.L. M.....	122.0	0.46,1	50,0	43,7	45,8	48,3	43,1	11,074	-20,27	122.0.25,76	G.
	$\gg$ N.L. M.....	122.0	0.46,1	50,0	43,7	45,8	48,3	43,1	10,920	-17,04	122.0.26,92	G.
July 22	$\gg$ N.L. M.....	122.0	0.46,1	50,0	43,7	45,8	48,3	43,1		-2,07		
									10,799	-14,42	122.0.27,47	G.
										-4,14		
July 22	$\odot$ S.L. M.....	75.30	2.17,0	20,8	17,0	16,1	20,5	14,8	12,264	-45,11	75.31.32,21	G.
	(f) $\odot$ N.L.....	74.55	4.59,2	62,0	59,8	60,0	61,8	57,3			75.0.0,02	G.

(a) At the 5th wire.

(b) Accidentally bisected by the fixed wire.

(c) Cloudy.

(d) At the five wires.

(e) At the five wires. Very much motion; and cloudy at the first three wires.

(f) No correction for runs.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.	
			Attach.	Free.							
"	" " "	Inch.	"	"	" "	" "	"	" "	" " "	"	
61,61	- 10. 14. 8,32	30,050	55,0	52,7	10,52				27. 32. 49,44	$\theta$ Cephei.	
	7. 30. 14,89				7,68				45. 17. 30,85	$\alpha$ Cygni R.	
	7. 30. 16,83								45. 17. 32,79	$\alpha$ Cygni.	
	22. 38. 56,40				24,34				60. 26. 29,02	* $\mathcal{R}$ . 21 <sup>h</sup> . 1 <sup>m</sup> . 50 <sup>s</sup> .	
	- 12. 46. 45,36				13,23				25. 0. 9,69	* $\mathcal{R}$ . 21 <sup>h</sup> . 2 <sup>m</sup> . 22 <sup>s</sup> .	
61,36	- 12. 44. 50,49	54,9	52,2		13,19				25. 2. 4,60	* $\mathcal{R}$ . 21 <sup>h</sup> . 2 <sup>m</sup> . 39 <sup>s</sup> .	
	38. 54. 57,56				47,06				76. 42. 52,90	* $\mathcal{R}$ . 21 <sup>h</sup> . 9 <sup>m</sup> . 15 <sup>s</sup> .	
	- 9. 41. 14,34				9,96				28. 5. 43,98	$\alpha$ Cephei R.	
	- 9. 41. 12,91								28. 5. 45,41	$\alpha$ Cephei.	
59,90	31. 0. 11,74	30,094	63,8	65,0	34,20	4,32	15. 45,50		68. 32. 4,40	$\odot$ .	
	30. 28. 40,78				33,49	4,25			68. 32. 3,80	$\odot$ .	
	- 30. 4. 1,29	30,100	62,2	60,8	33,23				7. 42. 33,76	$\epsilon$ Ursæ Min. R.	
	- 30. 4. 2,77								7. 42. 32,28	$\epsilon$ Ursæ Minoris.	
	10. 24. 24,21		61,3	59,4	10,58				48. 11. 43,07	* $\mathcal{R}$ . 17 <sup>h</sup> . 46 <sup>m</sup> . 8 <sup>s</sup> .	
60,28	14. 56. 3,91				15,36				52. 43. 27,55	$\theta$ Herculis.	
	0. 42. 13,18				0,71				38. 29. 22,17	$\gamma$ Draconis.	
	6. 31. 13,43				6,58				44. 18. 28,29	* $\mathcal{R}$ . 18 <sup>h</sup> . 0 <sup>m</sup> . 30 <sup>s</sup> .	
	69. 30. 20,46				57,2				2. 33,41	107. 20. 2,15	* $\mathcal{R}$ . 18 <sup>h</sup> . 27 <sup>m</sup> . 20 <sup>s</sup> .
	13. 34. 22,38				13,96					51. 21. 44,62	$\alpha$ Lyrae R.
60,39	13. 34. 21,66								51. 21. 43,90	$\alpha$ Lyrae.	
	19. 1. 44,41				19,95				56. 49. 12,64	$\beta$ Lyrae R.	
	19. 1. 43,91								56. 49. 12,14	$\beta$ Lyrae.	
	49. 55. 37,33				1. 8,63				87. 43. 54,24	* $\mathcal{R}$ . 18 <sup>h</sup> . 48 <sup>m</sup> . 20 <sup>s</sup> .	
	83. 21. 44,13	30,092	59,8	56,6	7. 41,56				121. 16. 33,97	S Sagittarii.	
	80. 59. 42,66				5. 49,73				118. 52. 40,67	A.S.C. 2212.	
	82. 9. 26,21				55,4	6. 38,44			120. 3. 12,93	O Sagittarii.	
	30. 38. 30,60	29,956	64,8	67,7	33,38	4,27	15. 45,50		68. 41. 53,49	$\odot$ .	
	31. 10. 0,53				34,08	4,34			68. 41. 53,05	$\odot$ .	
	34. 21. 41,54	29,926	67,5	69,3	38,36	4,12			72. 9. 24,06	Mercury.	
	66. 4. 1,08	29,540	64,8	64,3					103. 18. 36,38	$\mathcal{D}$ .	
	66. 4. 0,34						14. 46,96		103. 18. 35,64	$\mathcal{D}$ .	
	66. 3. 59,83				2. 5,31	49. 25,25			103. 18. 35,13	$\mathcal{D}$ .	
	66. 3. 58,83								103. 18. 34,13	$\mathcal{D}$ .	
	66. 3. 58,54								103. 18. 33,84	$\mathcal{D}$ .	
	71. 20. 0,73	29,600	61,7	60,5	2. 45,49	0,87	10,910	8,43	109. 9. 45,20	Saturn.	
61,42	- 12. 46. 46,12				12,88				25. 0. 9,28	* $\mathcal{R}$ . 21 <sup>h</sup> . 2 <sup>m</sup> . 22 <sup>s</sup> .	
	- 12. 44. 52,62				12,85				25. 2. 2,81	* $\mathcal{R}$ . 21 <sup>h</sup> . 2 <sup>m</sup> . 39 <sup>s</sup> .	
	38. 54. 59,03				45,83				76. 42. 53,14	* $\mathcal{R}$ . 21 <sup>h</sup> . 9 <sup>m</sup> . 15 <sup>s</sup> .	
	- 9. 41. 16,19				9,70				28. 5. 42,39	$\alpha$ Cephei R.	
	- 9. 41. 14,64								28. 5. 43,94	$\alpha$ Cephei.	
61,26	- 17. 38. 4,85				18,06				20. 8. 45,37	$\beta$ Cephei R.	
	- 17. 38. 3,61								20. 8. 46,61	$\beta$ Cephei.	
	78. 33. 27,86	29,870	61,0	59,9					115. 46. 33,49	$\mathcal{D}$ .	
	78. 33. 25,96								115. 46. 31,59	$\mathcal{D}$ .	
	78. 33. 25,12				4. 34,30	53. 32,27	14. 55,32		115. 46. 30,75	$\mathcal{D}$ .	
	78. 33. 26,28								115. 46. 31,91	$\mathcal{D}$ .	
	78. 33. 26,83								115. 46. 32,46	$\mathcal{D}$ .	
	32. 4. 31,57	29,990	66,2	66,5	35,43	4,45	15. 45,90		69. 36. 24,83	$\odot$ .	
31. 32. 59,38				34,72	4,39	69. 36. 23,89			$\odot$ .		

Coincidence of Micrometer Wire with fixed Wire = 10', 094, 10', 100, 10', 103, 10', 104, 10', 108 at the five wires.

One Micrometer Revolution = 20'', 873.

Correction for Runs = - 5'', 1.

Adopted Zenith Point = 43°. 27'. 0'', 64.

Assumed Co-latitude = 37°. 47'. 8'', 28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.	Microscopes.						Micrometer, or Time by Molyneux.	Correction for Microm. or Time.	Concluded reading of Circle.	Observer.
			A	B	C	D	E	F				
			° ' "	° ' "	° ' "	° ' "	° ' "	° ' "				
July 22	Saturn S.L. ....	114. 45	1. 27,8	34,0	28,8	31,2	31,4	28,8			114. 46. 30,08	G.
	(a) ) N.L. M. ....	124. 5	3. 18,0	22,2	18,3	18,4	23,0	17,4	20,792	-3. 43,30 - 2,12	124. 4. 33,56	G.
	) N.L. M. ....	124. 5	3. 18,0	22,2	18,3	18,4	23,0	17,4	20,808	-3. 43,51 - 1,06	124. 4. 34,41	G.
	) S.L. ....	124. 30	4. 35,0	40,0	35,9	35,8	40,5	34,8			124. 34. 36,22	G.
	) S.L. M. ....	124. 30	4. 35,0	40,0	35,9	35,8	40,5	34,8	10,260	- 3,26 + 1,06	124. 34. 34,02	G.
	) S.L. M. ....	124. 30	4. 35,0	40,0	35,9	35,8	40,5	34,8	10,222	- 2,38 + 2,12	124. 34. 35,96	G.
July 24	(b) ☉ S.L. ....	75. 55	0. 45,5	45,3	45,6	45,3	46,2	43,9			75. 55. 45,12	C.
July 26	☉ N.L. M. ....	75. 50	0. 60,2	59,1	61,4	60,7	62,6	58,8	13,656	-1. 14,33	75. 49. 45,89	C.
	☉ S.L. ....	76. 20	1. 18,1	15,3	17,3	17,7	18,9	16,6			76. 21. 16,98	C.
July 27	☉ S.L. M. ....	76. 35	0. 35,9	33,0	34,4	34,3	37,0	33,9	12,940	- 59,38	76. 34. 35,24	C.
	☉ N.L. ....	76. 0	3. 1,6	0,4	1,4	1,2	3,5	0,8			76. 3. 0,73	C.
Aug. 1	(c) Venus N.L. ....	94. 5	2. 51,7	55,7	51,5	53,3	56,6	51,3			94. 7. 52,62	C.
	Mars, center. ....	103. 30	3. 38,4	41,0	36,5	38,8	41,8	36,9			103. 33. 38,00	C.
	Polaris SP. R. M. ....	262. 45	3. 57,0	56,8	54,5	55,2	58,3	56,3	18,186 13. 19. 15	-2. 48,73 + 17,30	262. 46. 23,94	C.
	Polaris SP. ....	4. 5	2. 61,8	60,6	60,6	59,3	64,1	60,4	13. 21. 40	- 22,22	4. 7. 38,16	C.
	(d) Arcturus R. M. ....	191. 15	1. 47,0	48,2	45,7	47,4	50,6	46,5	12,165	- 43,27 - 0,05	191. 16. 3,80	C.
	Arcturus. ....	75. 35	2. 55,7	55,6	55,7	53,8	58,7	54,4		+ 0,05	75. 37. 54,97	C.
	(e) β Ursæ Min. R. M. ....	246. 0	3. 60,8	60,3	58,5	58,3	62,1	60,0	13,873	-1. 18,92 - 0,55	246. 2. 39,53	C.
	β Ursæ Minoris. ....	20. 50	1. 23,5	22,1	21,7	22,0	25,9	22,7			20. 51. 22,63	C.
	* R. 21 <sup>h</sup> . 1 <sup>m</sup> . 50 <sup>s</sup> . ..	66. 5	0. 51,0	49,6	49,7	47,7	50,3	48,2			66. 5. 49,22	C.
Aug. 2	(f) ☉ N.L. M. ....	77. 30	0. 22,8	22,3	21,8	22,5	24,6	21,8	13,633	-1. 13,86	77. 29. 8,67	C.
	☉ S.L. ....	78. 0	0. 42,0	42,8	40,8	42,5	45,7	41,5			78. 0. 42,37	C.
	Mercury, center. ....	87. 25	0. 29,3	29,9	29,1	30,3	33,5	28,2			87. 25. 29,93	C.
	(g) Venus N.L. ....	94. 35	0. 49,6	50,7	50,4	51,4	54,6	50,0			94. 35. 50,90	C.
	(h) Jupiter N.L. ....	99. 45	2. 60,2	60,0	58,4	59,5	65,3	58,5			99. 47. 59,57	C.
	Mars, center. ....	103. 45	2. 53,0	55,8	52,3	53,7	57,7	52,4			103. 47. 53,42	C.
	ε Bootis R. M. ....	199. 0	0. 31,2	32,4	27,5	31,7	34,5	32,8	11,856	- 36,75	198. 59. 54,80	C.
	(i) ε Bootis. ....	67. 50	4. 3,3	4,8	2,7	0,6	7,8	2,8		+ 0,08	67. 54. 2,73	C.
	α Coron. Bor. R. M. ....	198. 30	0. 48,7	48,4	45,4	49,4	51,0	49,7	11,930	- 38,30	198. 30. 10,27	C.
	(k) α Coronæ Borealis. ....	68. 20	3. 47,0	48,4	45,7	45,2	52,1	46,8		+ 0,31	68. 23. 46,89	C.
	Saturn N.L. ....	114. 45	1. 31,7	33,1	30,2	32,0	35,5	31,8			114. 46. 32,00	C.
	δ Arietis. ....	76. 30	2. 14,9	13,7	12,5	12,8	15,9	13,8			76. 32. 13,38	C.
	(l) ) N.L. M. ....	73. 5	4. 8,2	8,8	6,9	5,3	9,7	6,8	8,134	+ 40,87 - 3,30	73. 9. 44,15	C.
	) N.L. M. ....	73. 5	4. 8,2	8,8	6,9	5,3	9,7	6,8	8,222	+ 39,09	73. 9. 45,67	C.
	) N.L. M. ....	73. 5	4. 8,2	8,8	6,9	5,3	9,7	6,8	8,270	+ 38,18 + 3,30	73. 9. 48,06	C.
	) N.L. M. ....	73. 5	4. 8,2	8,8	6,9	5,3	9,7	6,8	8,453	+ 34,43 + 7,43	73. 9. 48,44	C.
	) N.L. M. ....	73. 5	4. 8,2	8,8	6,9	5,3	9,7	6,8	8,873	+ 25,86 + 14,85	73. 9. 47,29	C.
	(e) η Tauri R. M. ....	194. 50	1. 23,3	23,4	20,1	22,0	24,4	23,7	11,253	- 24,23 - 0,07	194. 50. 58,17	C.
	(m) η Tauri. ....	72. 0	3. 3,2	2,6	1,5	0,8	5,3	0,7		+ 0,26	72. 3. 1,86	C.
	Λ <sup>1</sup> Tauri. ....	74. 0	0. 54,7	54,9	54,8	54,3	57,6	54,9			74. 0. 54,97	C.
Aug. 3	(n) ☉ S.L. M. ....	78. 15	1. 41,7	42,7	41,1	38,9	47,0	39,5	11,734	- 34,21	78. 16. 7,19	C.
	☉ N.L. ....	77. 40	4. 32,0	33,5	30,6	28,9	37,3	29,3			77. 44. 30,80	C.
	(o) Venus N.L. ....	95. 0	3. 46,2	48,8	44,0	46,3	50,7	44,5			95. 3. 45,80	C.

Coincidences at the five wires and Runs taken Aug. 2, 6<sup>h</sup>. (Temp. 68°·5.)  
Molyneux slow on Hardy 11<sup>s</sup>, Aug. 1, 5<sup>h</sup>.

(a) At the five wires. Very rugged limbs; correction for defect of illumination insensible. (b) Shutters opened just before the observation. (c) Unsatisfactory. (d) At the 2nd and 4th wires. (e) At the 2nd wire. (f) Ragged and vibrating. (g) Much motion. (h) Faint. (i) At the 4th wire. (k) At the 5th wire. (l) At the 2nd, 3rd and 4th wires, and at 2<sup>h</sup> and 4<sup>h</sup> intervals past the middle wire; not satisfactory. Adopted coincidence for 4<sup>h</sup> intervals = 10<sup>s</sup>·112. (m) At the 5th wire; not good. (n) Immense waving and tremor; very uncertain observation. (o) Extremely mis-shapen and unsteady.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
	71. 19. 29,44	30,010	62,8	61,9	2. 47,22	0,86	10,875	8,06	109. 9. 16,02	Saturn.
	80. 37. 32,92		60,4	57,1	5. 35,51	54. 22,30			117. 50. 57,53	».
	80. 37. 33,77								117. 50. 58,38	».
	81. 7. 35,58							15. 3,12	117. 51. 6,74	».
	81. 7. 33,38				5. 53,22	54. 27,22			117. 51. 4,54	».
	81. 7. 35,32								117. 51. 6,48	».
	32. 28. 44,48	29,690	64,2	66,2	35,65	4,50		15. 46,10	70. 0. 37,81	☉.
	32. 22. 45,25	29,669	63,0	63,8	35,66	4,49		15. 46,30	70. 26. 11,00	☉.
	32. 54. 16,34				36,39	4,56			70. 26. 10,15	☉.
	33. 7. 34,60	29,516	62,5	64,0	36,49	4,59		15. 46,40	70. 39. 28,38	☉.
	32. 36. 0,09				35,76	4,52			70. 39. 26,01	☉.
	50. 40. 51,98	29,944	62,2	64,4	1. 9,12	10,06	8,904	12,99	88. 29. 12,31	Venus.
	60. 6. 37,36	29,968	64,3	65,1	1. 38,25	4,89			97. 55. 19,00	Mars.
61,05	- 39. 19. 23,30				46,39				- 1. 33. 1,41	Polaris SP. R.
	- 39. 19. 22,48								- 1. 33. 0,59	Polaris SP.
59,39	32. 10. 56,84			65,5	35,63				69. 58. 40,75	Arcturus R.
	32. 10. 54,33								69. 58. 38,24	Arcturus.
61,08	- 22. 35. 38,89	29,970		64,8	23,60				15. 11. 5,79	β Ursæ Min. R.
	- 22. 35. 38,01								15. 11. 6,67	β Ursæ Minoris.
	22. 38. 48,58	29,998	55,5	54,6	24,17				60. 26. 21,03	* R. 21 <sup>h</sup> . 1 <sup>m</sup> . 50 <sup>s</sup>
	34. 2. 8,03	30,000	61,9	67,5	38,12	4,69		15. 47,10	72. 5. 36,84	☉.
	34. 33. 41,73				38,88	4,75			72. 5. 37,04	☉.
	43. 58. 29,29		68,4	71,5	54,00	6,31			81. 46. 25,26	Mercury.
	51. 8. 50,26		70,4	72,6	1. 9,27	10,25	8,855	13,51	88. 57. 11,07	Venus.
	56. 20. 58,93	29,986	70,7	72,5	1. 23,73	1,22	8,705	14,50	94. 9. 44,22	Jupiter.
	60. 20. 52,78				1. 37,80	4,88			98. 9. 33,98	Mars.
58,77	24. 27. 5,84	29,976	69,5	70,1	25,52				62. 14. 39,64	ε Bootis R.
	24. 27. 2,09								62. 14. 35,89	ε Bootis.
58,58	24. 56. 50,37		67,7	68,3	26,20				62. 44. 24,85	α Coron. Bor. R.
	24. 56. 46,25								62. 44. 20,73	α Coronæ Bor.
	71. 19. 31,36	29,978	66,3	66,3	2. 45,57	0,85	9,206	9,28	109. 9. 33,64	Saturn.
	33. 5. 12,74	29,986	60,8	59,9	37,32				70. 52. 58,34	δ Arietis.
	29. 42. 43,51								67. 17. 25,65	».
	29. 42. 45,03								67. 17. 27,17	».
	29. 42. 47,42				32,69	29. 6,19		16. 7,36	67. 17. 29,56	».
	29. 42. 47,80								67. 17. 29,94	».
	29. 42. 46,65								67. 17. 28,79	».
60,02	28. 36. 2,47	29,994	61,2	60,9	31,18				66. 23. 41,93	η Tauri R.
	28. 36. 1,22								66. 23. 40,68	η Tauri.
	30. 33. 54,33				33,77				68. 21. 36,38	A <sup>1</sup> Tauri.
	34. 49. 6,55	30,016	66,6	71,4	38,97	4,80		15. 47,30	72. 21. 1,70	☉.
	34. 17. 30,16				38,21	4,73			72. 20. 59,22	☉.
	51. 36. 45,16	30,026	67,2	69,5	1. 10,92	10,45	8,925	12,77	89. 25. 6,68	Venus.

Coincidence of Micrometer Wire with fixed Wire = 10',094, 10',100, 10',103, 10',104, 10',108 at the five wires.

From July 26 = 10',087, 10',092, 10',095, 10',099, 10',102.

One Micrometer Revolution = 20'',873.

Correction for Runs = - 5'',1. From July 24 = - 7'',5.

Adopted Zenith Point = 43°. 27'. 0'',64.

Assumed Co-latitude = 37°. 47'. 8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.	Microscopes.						Micrometer, or Time by Molyneux.	Correction for Microm. or Time.	Concluded reading of Circle.	Observer.
			A	B	C	D	E	F				
			° ' "	° ' "	° ' "	° ' "	° ' "	° ' "				
Aug. 3	(a) Jupiter N.L. ....	99.50	1.36,1	39,2	35,8	37,6	40,8	35,9	15,877	-0,23	99.51.36,94	C.
	(b) α Lyrae R. M. ....	209.50	4.44,6	45,2	41,0	42,3	45,4	43,5		-2. 0,75	209.52.41,61	C.
	α Lyrae .....	57. 0	1.21,1	19,3	16,6	16,2	21,5	17,8		-0,12	57. 1.18,54	C.
Aug. 4	Aldebaran R. M. ....	187.25	1.38,4	38,7	36,0	37,3	40,3	39,1	12,246	-44,90	187.25.52,98	C.
	(c) Aldebaran .....	79.25	3.10,9	10,0	8,4	7,7	12,2	8,6	9,753	+0,89	79.28. 9,72	C.
	(d) α Orionis R. M. ....	178.35	2.27,0	28,1	24,9	26,5	28,7	26,7		+7,08	178.37.33,43	C.
	α Orionis .....	88.15	1.27,5	27,4	25,7	26,8	29,4	26,7		-0,02	88.16.26,90	C.
	(e) Procyon R. M. ....	176.50	3. 0,3	2,5	0,1	1,1	4,0	0,4	9,584	+0,02	176.53.11,41	C.
	Procyon .....	90. 0	0.46,4	47,8	46,7	46,7	49,7	45,1	14,970	-0,06	90. 0.47,15	C.
Aug. 5	⊙ S.L. M. ....	78.45	4.32,5	33,5	30,5	30,8	35,2	29,3		+10,82	78.47.49,08	C.
	⊙ N.L. ....	78.15	1.15,5	16,1	14,4	14,5	19,0	13,0		-0,28	78.16.15,08	C.
	Mercury, center ...	89. 5	0.41,6	43,6	40,5	42,0	45,3	41,3	17,402	+0,28	89. 5.42,20	C.
	Venus N.L. ....	95.55	4.25,6	27,3	22,7	24,2	28,6	23,4		-0,12	95.59.24,20	C.
	Mars, center .....	104.30	0.41,5	43,2	39,4	42,7	45,3	40,2		+0,12	104.30.41,88	C.
	(f) λ Ursæ Min. R. M. ....	260. 5	0.36,0	35,7	33,0	35,3	37,7	36,0	9,934	-2.32,52	260. 3. 2,95	C.
	λ Ursæ Minoris ...	6.50	0.62,6	57,9	61,0	58,5	62,5	59,8		-0,06	6.51. 0,13	C.
Aug. 6	(g) ⊙ N.L. M. ....	78.30	2.24,5	28,0	20,6	24,5	28,4	24,7		+3,36	78.32.27,88	C.
	⊙ S.L. ....	79. 0	4. 4,4	6,0	2,1	4,5	8,2	2,0	17,997	-0,06	79. 4. 3,52	C.
Aug. 7	(h) 55 Camel. SP. R. M. ....	282.15	4. 4,5	2,9	3,5	1,6	5,9	3,5		+3,36	282.16.19,51	C.
	55 Camelopardi SP. ....	344.35	2.47,8	45,1	46,3	45,7	50,5	46,0	1,473	+1,57	344.37.42,68	C.
Aug. 8	(i) η Draconis R. M. ....	233. 0	3.54,9	55,7	52,0	52,3	55,6	53,7		-3,52	233. 6.52,69	C.
	η Draconis .....	33.45	2. 9,0	10,6	7,5	6,8	9,6	8,1	13,375	-0,28	33.47. 8,30	C.
	(i) α Lyrae R. M. ....	209.50	3.54,2	54,0	52,7	53,3	55,7	52,1		+0,28	209.52.44,06	C.
	α Lyrae .....	57. 0	1.20,2	17,1	16,6	15,6	19,4	16,8	10,550	-0,12	57. 1.17,39	C.
Aug. 9	(k) Mercury, center ...	91. 5	1.46,3	48,5	45,8	48,2	51,4	45,4		+0,12	91. 6.47,12	C.
Aug. 10	(l) Mars, center .....	105.40	1.59,0	60,8	57,5	60,4	62,9	57,0	12,258	-9,24	105.41.59,05	C.
	(m) α Lyrae R. M. ....	209.50	3.28,7	32,0	26,8	28,5	30,9	28,2		-1,64	209.52.43,00	C.
	α Lyrae .....	57. 0	1.17,9	17,0	16,3	15,4	18,5	16,3	16,284	+0,12	57. 1.16,67	C.
	(n) * R. 20 <sup>h</sup> .24 <sup>m</sup> .9 <sup>s</sup> . M. ....	32.20	0. 2,5	6,1	4,0	2,8	5,3	2,7		-2. 9,08	32.17.54,80	C.
	* R. 21 <sup>h</sup> .2 <sup>m</sup> .39 <sup>s</sup> . ..	30.40	1.60,4	62,6	60,5	57,9	61,7	59,2	10,545	-0,12	30.41.59,83	C.
	(h) β Cephei R. M. ....	241. 5	0.24,3	27,0	20,7	22,8	25,5	24,9		-9,24	241. 5.13,20	C.
	β Cephei .....	25.45	3.46,0	49,3	44,8	43,0	49,0	44,8	11,180	-1,64	25.48.48,81	C.
Aug. 12	(o) β Aquarii R. M. ....	164.55	4.42,8	46,5	44,0	43,5	47,2	43,8		+3,69	164.59.22,39	C.
	(p) β Aquarii .....	101.50	4.38,8	40,6	36,7	35,3	41,0	36,4	10,545	+0,06	101.54.36,57	C.
	(q) α Aquarii R. M. ....	170. 5	4.52,0	55,4	53,1	51,7	56,5	51,5		-0,30	170. 9.42,89	C.
	(r) α Aquarii .....	96.40	4.14,5	15,1	14,8	12,7	17,6	13,8	11,383	-9,15	96.44.13,52	C.
Aug. 13	⊙ S.L. M. ....	81. 5	0.43,9	44,9	44,1	43,3	47,6	43,3		+0,01	81. 5.17,56	C.
	⊙ N.L. ....	80.30	3.42,0	45,4	42,4	41,0	45,5	41,2	11,356	-0,06	80.33.41,90	C.
Aug. 15	(s) Aldebaran R. M. ....	187.25	1.16,4	19,0	15,5	17,3	19,7	17,5		-26,77	187.25.51,01	C.
	Aldebaran .....	79.25	3. 9,6	11,5	8,6	8,1	12,5	8,3		+0,27	79.28. 9,17	C.

Coincidence at middle wire and Runs taken Aug. 13, 2<sup>h</sup>. (Temp. 61°.)

(a) At the comb; very faint and doubtful. Correction for change of N.P.D. = -0",13. (b) At the 2nd and 4th wires. Direct observation very cloudy. (c) 4<sup>h</sup> intervals past middle wire. (d) At the 2nd and 4th wires; very unsteady. (e) At 2 and 4<sup>h</sup> intervals; mercury waving and star unsteady. (f) Barometer and Thermometer read, and divisions for direct observation bisected and read off, an hour and a half after the observation, which in other respects was good. (g) The Sun had been shining feebly on the instrument. (h) At the 5th wire and comb. (i) At the 2nd and 4th wires. (k) Before this observation some weights were taken from the counterpoise. (l) Good. (m) At the 2nd and 4th wires; wind disturbed the mercury. (n) Doubtful bisection. (o) At the 5th wire; cloudy. Small correction for runs on the negative side. (p) 4<sup>h</sup> intervals late. (q) At the 5th wire; almost a guess, mercury disturbed. (r) 4<sup>h</sup> intervals late; cloudy. (s) Too much wind; direct observation 2<sup>h</sup> intervals past middle wire.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
60,08	56.24.36,30	30,026	67,2	69,5	1.24,53	1,22	8,904	12,54	94.13.20,43	Jupiter.
	13.34.19,03	30,074	65,0	63,6	13,77				51.21.41,08	$\alpha$ Lyræ R.
	13.34.17,90								51.21.39,95	$\alpha$ Lyræ.
61,35	36.1.7,66	30,226	58,2	57,8	42,15				73.48.58,09	Aldebaran R.
	36.1.9,08								73.48.59,51	Aldebaran.
60,17	44.49.27,21	30,230	59,7	60,5	57,28				82.37.32,77	$\alpha$ Orionis R.
	44.49.26,26								82.37.31,82	$\alpha$ Orionis.
59,28	46.33.49,23	30,250	66,8	63,6	1.05,2				84.21.58,03	Procyon R.
	46.33.46,51								84.21.55,31	Procyon.
61,54	35.20.48,44	30,230	63,6	64,2	40,60	4,86		15.47,50	72.52.44,96	$\odot$ .
	34.49.14,44				39,82	4,80			72.52.45,24	$\odot$ .
	45.38.41,56	30,212	63,2	64,7	58,41	6,81			83.26.41,44	Mercury.
	52.32.23,56	30,202	63,6	65,6	1.14,32	10,85	8,853	13,56	90.20.48,87	Venus.
	61.3.41,24	30,186	65,3	65,8	1.42,72	4,85			98.52.27,37	Mars.
	-36.36.2,31	30,134	57,7	56,3	43,05				1.10.22,92	$\lambda$ Ursæ Min. R.
	-36.36.0,51								1.10.24,72	$\lambda$ Ursæ Minoris.
	35.5.27,24	30,090	65,8	66,8	39,83	4,83		15.47,70	73.8.58,22	$\odot$ .
	35.37.2,88				40,61	4,90			73.8.59,17	$\odot$ .
61,10	-58.49.18,87	29,730	59,5	57,5	1.34,04				-21.3.44,63	{55 Camelopardi
	-58.49.17,96								-21.3.43,72	SP. R. 55 Camelop. SP.
60,50	-9.39.52,05	29,992	61,3	60,3	9,75				28.7.6,48	$\eta$ Draconis R.
	-9.39.52,34								28.7.6,19	$\eta$ Draconis.
60,73	13.34.16,58	30,020	59,0	57,6	13,91				51.21.38,77	$\alpha$ Lyræ R.
	13.34.16,75								51.21.38,94	$\alpha$ Lyræ.
59,84	47.39.46,48	30,040	66,2	66,8	1.2,06	7,53			85.27.49,29	Mercury.
	62.14.58,41	29,960	65,8	66,0	1.47,03	4,81			100.3.48,91	Mars.
	13.34.17,64	29,940	58,2	56,6	13,91				51.21.39,83	$\alpha$ Lyræ R.
	13.34.16,03								51.21.38,22	$\alpha$ Lyræ.
61,00	-11.9.5,84	29,926	56,3	55,4	11,38				26.37.51,06	* $\mathcal{R}$ .20 <sup>h</sup> .24 <sup>m</sup> .9 <sup>s</sup> .
	-12.45.0,81	29,908	56,4	56,1	13,03				25.1.54,44	* $\mathcal{R}$ .21 <sup>h</sup> .2 <sup>m</sup> .39 <sup>s</sup> .
	-17.38.12,56				18,31				20.8.37,41	$\beta$ Cephei R.
	-17.38.11,83								20.8.38,14	$\beta$ Cephei.
59,48	58.27.38,25	30,156	55,7	54,7	1.34,59				96.16.21,12	$\beta$ Aquarii R.
	58.27.35,93								96.16.18,80	$\beta$ Aquarii.
58,21	53.17.17,75	30,150	55,3	53,4	1.18,12				91.5.44,15	$\alpha$ Aquarii R.
	53.17.12,88								91.5.39,28	$\alpha$ Aquarii.
60,09	37.38.16,92	30,088	59,9	61,7	44,15	5,14		15.48,80	75.10.15,41	$\odot$ .
	37.6.41,26				43,32	5,08			75.10.16,58	$\odot$ .
	36.1.9,63	29,552	59,8	59,0	41,11				73.48.59,02	Aldebaran R.
	36.1.8,53								73.48.57,92	Aldebaran.

Coincidence of Micrometer Wire with fixed Wire = 10',095, at the middle wire. From Aug. 7 = 10',100.

One Micrometer Revolution = 20'',873.

Correction for Runs = -7'',5. From Aug. 8 = -8'',2.

Adopted Zenith Point = 43°.27'.0'',64.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer. ° ' "	Microscopes.						Micrometer, or Time by Molyneux. r. h. m. s.	Correction for Microm. or Time. " "	Concluded reading of Circle. ° ' "	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
Aug. 15	(a) Capella R. M. ....	217. 0	3. 47,3	49,4	43,5	45,2	48,7	45,3	9,747	+ 7,30 - 0,16	217. 3. 52,67	C.
	(b) Capella.....	49. 45	5. 8,5	10,7	7,2	6,5	12,3	7,8		+ 0,16	49. 50. 7,59	C.
Aug. 17	(c) α Ophiuchi R. M..	183. 55	0. 47,6	48,3	45,1	46,8	49,6	46,7	9,830	+ 5,57 - 0,04	183. 55. 52,66	C.
	α Ophiuchi.....	82. 55	3. 9,8	11,1	8,1	8,8	12,4	7,5		+ 0,04	82. 58. 8,79	C.
	(d) α Lyrae R. M. ....	209. 50	3. 28,8	29,3	25,2	26,0	30,4	25,7	12,029	- 40,33 - 0,12	209. 52. 46,17	C.
	α Lyrae.....	57. 0	1. 18,1	16,7	14,7	14,2	18,4	15,3		+ 0,12	57. 1. 16,00	C.
Aug. 20	(e) » S.L. M.....	124. 55	1. 55,2	62,1	58,2	57,2	59,7	55,3	11,002	- 18,87 - 1,80	124. 56. 36,73	G.
	» S.L. M.....	124. 55	1. 55,2	62,1	58,2	57,2	59,7	55,3	10,960	- 17,91 - 0,90	124. 56. 38,59	G.
	» S.L. M.....	124. 55	1. 55,2	62,1	58,2	57,2	59,7	55,3	10,923	- 17,06	124. 56. 40,34	G.
	» S.L. M.....	124. 55	1. 55,2	62,1	58,2	57,2	59,7	55,3	10,940	- 17,33 + 0,90	124. 56. 40,97	G.
	» S.L. M.....	124. 55	1. 55,2	62,1	58,2	57,2	59,7	55,3	10,988	- 18,31 + 1,80	124. 56. 40,89	G.
	Uranus.....	102. 15	0. 6,2	11,2	7,2	7,5	6,5	5,2			102. 15. 7,27	G.
Aug. 21	(f) ☉ N.L. M.....	83. 5	2. 16,3	21,7	18,2	17,6	17,9	15,1	13,128	- 1. 2,98 - 0,35	83. 6. 13,82	G.
	☉ S.L.....	83. 35	2. 55,9	59,8	57,2	55,2	58,4	53,0		- 0,42	83. 37. 55,33	G.
	(g) » S.L. M.....	123. 0	2. 40,4	44,5	40,0	41,0	43,0	39,8	11,051	- 19,89 - 4,30	123. 2. 16,49	G.
	» S.L. M.....	123. 0	2. 40,4	44,5	40,0	41,0	43,0	39,8		- 22,56 - 2,15	123. 2. 15,97	G.
	» S.L. M.....	123. 0	2. 40,4	44,5	40,0	41,0	43,0	39,8	11,215	- 23,15	123. 2. 17,53	G.
	» S.L. M.....	123. 0	2. 40,4	44,5	40,0	41,0	43,0	39,8		- 26,23 + 2,15	123. 2. 16,60	G.
	» S.L. M.....	123. 0	2. 40,4	44,5	40,0	41,0	43,0	39,8	11,469	- 28,34 + 4,30	123. 2. 16,64	G.
	γ Aquilæ R. M....	181. 25	2. 38,0	46,2	40,1	40,8	41,0	41,4	7,168	+ 1. 1,34	181. 28. 41,82	G.
	γ Aquilæ.....	85. 25	0. 17,8	24,0	19,3	20,0	21,5	18,8			85. 25. 20,15	G.
	ε Sagittarii.....	123. 40	3. 20,7	29,5	22,3	22,4	24,4	22,5	6,408	+ 1. 17,19	123. 43. 22,67	G.
Aug. 22	α Aquarii R. M....	170. 5	3. 24,0	33,5	27,2	25,8	30,0	27,2			170. 9. 44,17	G.
	α Aquarii.....	96. 40	4. 18,8	18,1	15,9	12,5	18,1	14,1			96. 44. 15,03	G.
	Uranus.....	102. 15	0. 57,2	63,8	60,1	58,1	59,0	56,6			102. 15. 58,87	G.
	☉ S.L. M.....	83. 55	4. 14,9	21,8	16,4	15,2	22,6	14,5	14,110	- 1. 23,57	83. 57. 52,78	G.
	☉ N.L.....	83. 25	1. 11,3	17,6	14,2	14,0	17,4	10,8			83. 26. 13,87	G.
	(h) Venus N.L.....	103. 20	4. 6,7	14,1	7,9	9,0	11,9	6,5		- 1,02	103. 24. 7,15	G.
	(g) » S.L.....	119. 30	2. 3,8	9,1	5,8	6,0	7,7	5,9		- 6,44	119. 31. 59,34	G.
	» S.L. M.....	119. 30	2. 3,8	9,1	5,8	6,0	7,7	5,9	10,247	- 3,02 - 3,22	119. 31. 59,54	G.
	» S.L. M.....	119. 30	2. 3,8	9,1	5,8	6,0	7,7	5,9		- 5,80	119. 31. 59,98	G.
	» S.L. M.....	119. 30	2. 3,8	9,1	5,8	6,0	7,7	5,9	10,477	- 7,66 + 3,22	119. 32. 1,34	G.
	» S.L. M.....	119. 30	2. 3,8	9,1	5,8	6,0	7,7	5,9		- 12,17 + 6,44	119. 32. 0,05	G.
	α Cygni R. M.....	215. 55	2. 8,0	11,1	7,4	8,8	12,0	9,2	10,684	- 12,07	215. 56. 56,73	G.
	α Cygni.....	50. 55	2. 3,8	6,0	4,2	2,8	5,2	3,6			50. 57. 3,68	G.
	η Capricorni.....	116. 5	0. 49,8	54,0	49,3	51,0	51,5	50,1			116. 5. 50,72	G.
	(i) * R. 21 <sup>h</sup> . 1 <sup>m</sup> . 50 <sup>s</sup> ..	66. 5	0. 43,2	43,8	43,5	43,7	45,9	43,0			66. 5. 43,65	G.
	δ Capricorni.....	111. 25	2. 28,5	31,0	28,3	28,0	31,4	27,9			111. 27. 28,47	G.
	(k) * R. 21 <sup>h</sup> . 9 <sup>m</sup> . 15 <sup>s</sup> ..	82. 20	1. 49,0	51,3	50,5	48,1	53,0	48,3			82. 21. 49,52	G.
	α Cephei R. M....	233. 5	3. 21,0	22,1	19,8	19,7	21,8	22,3	9,745	+ 7,53	233. 8. 27,71	G.
	α Cephei.....	33. 45	0. 32,0	35,0	30,4	31,6	34,8	34,2			33. 45. 32,85	G.
	Uranus.....	102. 15	1. 53,0	58,8	54,4	53,1	57,8	53,8			102. 16. 54,62	G.

Runs taken Aug. 23, 11<sup>h</sup>. (Temp. 58°). Coincidences at the five wires taken Aug. 24, 1<sup>h</sup>.

(a) At the 2nd wire. Microscope A having been moved before reading off after the direct observation, the reading was supplied by replacing the circle by means of the other microscopes. (b) At the 4th wire. (c) At the 2nd and 4th wires. Before this observation microscope F was found twisted from its position from some unknown cause; it was restored by setting the circle as in the last observation of Capella. (d) At the 2nd and 4th wires; the direct observation cloudy. (e) At the five wires; very badly defined. (f) At the 5th wire and comb; hurried. Corrections for change of N.P.D. = -0",48 and -0",71 respectively. (g) At the five wires. (h) At the comb; hurried. Correction for change of N.P.D. = -0",84. (i) A close and pretty double star. (k) Very faint.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.		
			Attach.	Free.								
"	° ' "	Inch.	°	°	' "	' "	"	' "	° ' "			
60,13	6.23.7,97	29,562	60,0	60,0	6,32				44.10.22,57	Capella R.		
	6.23.6,95								44.10.21,55	Capella.		
60,73	39.31.7,98	29,746	59,2	58,1	47,03				77.19.3,29	α Ophiuchi R.		
	39.31.8,15								77.19.3,46	α Ophiuchi.		
61,09	13.34.14,47	29,758	58,4	57,5	13,80				51.21.36,55	α Lyrae R.		
	13.34.15,36								51.21.37,44	α Lyrae.		
	81.29.35,91	30,068	53,2	49,2					118.12.22,10	„		
	81.29.37,77								118.12.23,96	„		
	81.29.39,52				6.14,40	55.19,75			118.12.25,71	„		
	81.29.40,15				118.12.26,34	„						
	81.29.40,07	30,080	48,0	45,6	1.37,42	0,38	15.16,74	118.12.26,26	„			
	58.48.6,45							96.36.51,77	Uranus.			
	39.39.13,00							77.42.54,30	☉.			
	40.10.54,51	30,128	55,6	55,6	48,10	5,38		77.42.56,06	☉.			
	79.35.15,67	30,116	54,3	52,2				116.16.15,33	„			
	79.35.15,15							116.16.14,81	„			
	79.35.16,71							5.7,82	55.46,96	116.16.16,37	„	
	79.35.15,78							116.16.15,44	„			
	79.35.15,82							116.16.15,48	„			
60,99	41.58.19,00	30,104	51,4	48,1	52,53				79.46.19,81	γ Aquilæ R.		
	41.58.19,33				5.28,46				79.46.20,14	γ Aquilæ.		
59,60	80.16.21,85	30,100	49,5	46,8	1.18,85	0,38			118.8.58,59	c Sagittarii.		
	53.17.16,65				1.37,29				91.5.43,78	α Aquarii R.		
	53.17.14,21	30,100	49,5	46,8	1.37,29	0,38			91.5.41,34	α Aquarii.		
	58.48.58,05								96.37.43,24	Uranus.		
	40.30.51,96	30,144	58,9	61,1	49,07	5,48	8,610	15.50,50	78.2.53,33	☉.		
	39.59.13,05	30,136	61,2	62,5	48,16	5,42			78.2.54,57	☉.		
	59.57.6,33				1.38,68	14,98	97.45.54,88	Venus.				
	76.4.58,52	30,150	56,3	55,5	3.50,21	55.49,56			112.44.24,67	„		
	76.4.58,72							15.42,78	112.44.24,87	„		
	76.4.59,16								112.44.25,31	„		
	76.5.0,52								112.44.26,67	„		
	76.4.59,23								112.44.25,38	„		
60,21	7.30.4,09				7,65				45.17.20,02	α Cygni R.		
	7.30.2,86				3.3,87				45.17.18,79	α Cygni.		
60,28	72.38.49,90			55,3	24,26				110.29.2,05	η Capricorni.		
	22.38.42,83				2.22,95				60.26.15,37	* R. 21 <sup>h</sup> . 1 <sup>m</sup> . 50 <sup>s</sup> .		
	68.0.27,65				46,91				105.49.58,88	s Capricorni.		
	38.54.48,70				9,93				76.42.43,89	* R. 21 <sup>h</sup> . 9 <sup>m</sup> . 15 <sup>s</sup> .		
	-9.41.26,89				1.35,99	0,38			28.5.31,46	α Cephei R.		
	-9.41.27,97								28.5.30,38	α Cephei.		
	58.49.53,80								96.38.37,69	Uranus.		

Coincidence of Micrometer Wire with fixed Wire = 10',100 at the middle wire. From Aug. 20 = 10',098, 10',102, 10',106, 10',110, 10',111 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = -8'',2. From Aug. 20 = -8'',5.

Adopted Zenith Point = 43°.27'.0'',64. From Aug. 20 = 43°.27'.0'',82.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.	Microscopes.						Micrometer, or Time by Molyneux.	Correction for Microm. or Time.	Concluded reading of Circle.	Observer.
			A	B	C	D	E	F				
			° ' "	° ' "	° ' "	° ' "	° ' "	° ' "				
Aug. 23	(a) ☉ N.L. M.....	83.45	2. 6,8	13,2	7,8	7,4	11,8	5,8	12,244	- 44,64	83.46.23,54	G.
	☉ S.L.....	84.15	3. 0,9	7,0	1,8	2,2	8,8	1,5			84.18. 2,83	G.
	α Lyræ R. M. ....	209.50	3. 15,9	18,0	15,3	17,4	19,6	17,4	11,620	- 31,60	209.52.44,73	G.
	α Lyræ... ..	57. 0	1. 13,2	16,8	13,1	12,0	17,0	13,8			57. 1.13,97	G.
	(b) β Lyræ R. ....	204.25	0. 22,9	25,1	22,8	24,8	25,4	26,0			204.25.24,38	G.
	β Lyræ.....	62.25	3. 36,0	39,1	36,1	34,9	39,8	38,4			62.28.36,37	G.
	(c) β <sup>2</sup> Lyræ R. M. ....	204.25	0. 22,9	25,1	22,8	24,8	25,4	26,0	12,060	- 40,78	204.24.43,60	G.
	β <sup>2</sup> Lyræ M.....	62.25	3. 36,0	39,1	36,1	34,9	39,8	38,4	8,203	+ 39,72	62.29.16,09	G.
	A.S.C. 2212.....	124.25	1. 46,8	52,3	48,1	47,8	53,0	47,9			124.26.48,80	G.
	O Sagittarii.....	125.35	1. 32,2	36,9	33,0	33,9	38,8	34,1			125.36.34,37	G.
	(d) δ S.L. ....	114.35	1. 29,0	34,5	29,0	30,3	32,2	30,8		- 8,08	114.36.22,45	G.
	δ S.L. M. ....	114.35	1. 29,0	34,5	29,0	30,3	32,2	30,8	10,298	- 4,10	114.36.22,39	G.
	δ S.L. M.....	114.35	1. 29,0	34,5	29,0	30,3	32,2	30,8	10,508	- 8,39	114.36.22,14	G.
	δ S.L. M.....	114.35	1. 29,0	34,5	29,0	30,3	32,2	30,8	10,690	- 12,11	114.36.22,46	G.
	δ S.L. M.....	114.35	1. 29,0	34,5	29,0	30,3	32,2	30,8	10,871	- 15,86	114.36.22,75	G.
	(e) δ Capricorni.....	112.25	3. 23,8	26,5	24,2	22,8	27,5	24,5		- 0,41	112.28.23,51	G.
	(e) α Aquarii.....	110.15	1. 12,8	17,3	13,4	12,6	14,9	12,8		- 0,36	110.16.13,26	G.
	(f) Uranus.....	102.15	2. 45,1	51,7	46,0	44,6	53,8	46,1		- 0,10	102.17.46,98	G.
Aug. 24	(g) ☉ S.L. M.....	84.35	3. 26,0	32,8	26,5	26,7	32,0	26,8	10,180	- 1,54	84.38.25,94	G.
	☉ N.L.....	84. 5	1. 46,0	53,0	47,1	47,2	53,5	46,2			84. 6.48,32	G.
	(h) δ N.L. M.....	107.55	4. 17,2	21,5	17,0	14,3	20,7	16,9	6,920	+ 1. 6,34	108. 0.13,92	G.
	δ N.L. M.....	107.55	4. 17,2	21,5	17,0	14,3	20,7	16,9	7,048	- 9,14	108. 0.15,89	G.
	δ S.L.....	108.30	2. 39,7	45,9	39,9	39,8	45,0	41,2		+ 1. 3,74	108.32.41,15	G.
	δ S.L. M.....	108.30	2. 39,7	45,9	39,9	39,8	45,0	41,2	10,345	- 4,90	108.32.40,82	G.
	δ S.L. M.....	108.30	2. 39,7	45,9	39,9	39,8	45,0	41,2	10,572	+ 4,57	108.32.40,67	G.
	α Aquarii.....	104. 0	3. 56,0	60,2	56,8	55,1	61,0	55,2		- 9,62	104. 3.56,27	G.
	α Pegasi R. M. ....	185.30	4. 16,6	20,0	15,8	15,3	21,8	18,7	6,296	+ 9,14	185.35.36,35	G.
	α Pegasi.....	81.15	3. 23,9	25,2	23,3	21,4	27,2	25,0		+ 1.19,53	81.18.23,37	G.
	Uranus.....	102.15	3. 44,2	48,1	44,2	42,2	49,4	43,8			102.18.44,25	G.
Aug. 25	α Aquarii.....	104. 0	3. 53,9	56,1	55,8	52,8	56,5	52,8			104. 3.53,55	G.
	(d) δ N.L.....	101. 5	4. 58,3	60,2	61,4	56,8	63,4	59,1		- 9,72	101. 9.48,73	G.
	δ N.L. M.....	101. 5	4. 58,3	60,2	61,4	56,8	63,4	59,1	10,260	- 3,30	101. 9.50,29	G.
	δ N.L. M.....	101. 5	4. 58,3	60,2	61,4	56,8	63,4	59,1	10,501	- 4,86	101. 9.50,21	G.
	δ N.L. M.....	101. 5	4. 58,3	60,2	61,4	56,8	63,4	59,1	10,763	- 8,24	101. 9.49,69	G.
	δ N.L. M.....	101. 5	4. 58,3	60,2	61,4	56,8	63,4	59,1	10,999	- 13,62	101. 9.49,63	G.
Aug. 26	☉ S.L. M.....	85.20	1. 22,3	27,4	23,2	23,4	26,2	21,8	14,905	+ 4,86	85.19.43,48	G.
	☉ N.L.....	84.45	3. 1,4	7,1	2,2	2,0	5,8	0,9		- 18,54	84.48. 2,37	G.
Aug. 27	☉ N.L. M.....	85. 5	4. 26,3	31,3	26,2	24,8	32,0	25,1	11,655	+ 9,72	85. 8.54,04	G.
	☉ S.L.....	85.40	0. 35,8	40,9	36,1	36,8	40,3	36,0			85.40.37,48	G.
	(i) * R. 22 <sup>h</sup> . 35 <sup>m</sup> . 24 <sup>s</sup> .	29.55	4. 55,8	59,2	56,4	55,0	57,4	55,9			29.59.56,62	G.
	(k) * R. 22 <sup>h</sup> . 35 <sup>m</sup> . 55 <sup>s</sup> . M.	29.55	4. 55,8	59,2	56,4	55,0	57,4	55,9	18,171	- 2.48,33	29.57. 8,29	G.
	γ Cephei.....	30.15	3. 39,0	41,9	38,0	35,8	41,9	38,0			30.18.38,07	G.
	α Pegasi R. M. ....	185.30	3. 44,0	48,0	43,9	43,2	48,7	45,0	4,703	+ 1.52,78	185.35.37,18	G.
	α Pegasi.....	81.15	3. 22,8	25,4	22,8	21,2	26,1	23,8			81.18.22,72	G.
	Uranus.....	102.20	1. 23,8	27,5	23,8	23,5	29,0	23,4			102.21.24,77	G.
	γ Cephei R. M. ....	247.55	3. 24,9	28,3	23,1	23,1	27,0	26,2	11,548	- 30,09	247.57.54,38	G.
	γ Cephei.....	18.55	1. 8,4	12,2	9,4	6,6	11,1	7,2			18.56. 8,82	G.

(a) Cloudy.

(b) Accidentally bisected by the fixed wire; pretty good.

(c) β Lyræ's companion.

(d) At the five wires.

(e) At the comb.

(f) At the 5th wire.

(g) Without the dark glass; unsatisfactory.

(h) At the five wires. Both limbs fully illumined.

(i) No correction for runs.

(k) A minute star, extremely faint.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N.P.D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	" ' "	Inch.	"	"	" "	" "	"	" "	" ' "	"
59,35	40.19.22,72	30,180	60,3	64,3	48,48	5,46		15.50,70	78.23.4,72	☉.
	40.51.2,01				49,39	5,52			78.23.3,46	☉.
	13.34.16,09	30,140	61,5	61,0	13,87				51.21.38,24	α Lyrae R.
	13.34.13,15								51.21.35,30	α Lyrae.
	19.1.36,44				19,82				56.49.4,54	β Lyrae R.
	19.1.35,55								56.49.3,65	β Lyrae.
	19.2.17,22				19,83				56.49.45,33	β <sup>2</sup> Lyrae R.
	19.2.15,27								56.49.43,38	β <sup>2</sup> Lyrae.
	80.59.47,98		61,5	60,6	5.47,40				118.52.43,66	A.S.C. 2212.
	82.9.33,55				6.34,85				120.3.16,68	O Sagittarii.
60,38	71.9.21,63	30,122	59,7	58,0					107.48.13,34	☾.
	71.9.21,57								107.48.13,28	☾.
	71.9.21,32				2.47,58	55.8,68		15.55,47	107.48.13,03	☾.
	71.9.21,64								107.48.13,35	☾.
	71.9.21,93								107.48.13,64	☾.
	69.1.22,69	30,118	59,4	57,6	2.29,59				106.51.0,56	δ Capricorni.
	66.49.12,44				2.14,16				104.38.34,88	ι Aquarii.
	58.50.46,16	30,100	58,3	55,6	1.35,67	0,38			96.39.29,73	Uranus.
	41.11.25,12	30,010	65,2	66,0	49,54	5,56			78.43.26,38	☉.
	40.39.47,50				48,63	5,50			78.43.29,91	☉.
59,85	64.33.13,10	29,900	62,5	61,0	1.59,18	53.11,30		15.51,00	101.45.15,50	☾.
	64.33.15,07								101.45.17,47	☾.
	65.5.40,33								101.45.18,67	☾.
	65.5.40,00				2.2,12	53.25,82			101.45.18,34	☾.
	65.5.39,85								101.45.18,19	☾.
	60.36.55,45			60,0	1.41,07				98.25.44,80	λ Aquarii.
	37.51.24,47				44,38				75.39.17,13	α Pegasi R.
	37.51.22,55								75.39.15,21	α Pegasi.
	58.51.43,43				1.34,25	0,38			96.40.25,58	Uranus.
	60.36.52,73	29,860	58,0	54,4	1.42,08			16.14,46	98.25.43,09	λ Aquarii.
59,86	57.42.47,91								94.57.30,28	☾.
	57.42.49,47								94.57.31,84	☾.
	57.42.49,39				1.31,05	50.11,42			94.57.31,76	☾.
	57.42.48,87								94.57.31,24	☾.
	57.42.48,81								94.57.31,18	☾.
	41.52.42,66	29,842	64,0	65,0	50,57	5,64		15.51,40	79.24.44,47	☉.
	41.21.1,55				49,64	5,58			79.24.45,29	☉.
	41.41.53,22	29,730	61,4	61,5	50,41	5,62			79.45.37,89	☉.
	42.13.36,66				51,35	5,68			79.45.39,01	☉.
	-13.27.4,20	29,870	56,3	53,0	13,84				24.19.50,24	*R.22 <sup>h</sup> .35 <sup>m</sup> .24 <sup>s</sup> .
	-13.29.52,53				13,90				24.17.1,85	*R.22 <sup>h</sup> .35 <sup>m</sup> .55 <sup>s</sup> .
	-13.8.22,75				13,51				24.38.32,02	ι Cephei.
	37.51.23,64				44,96				75.39.16,88	α Pegasi R.
	37.51.21,90								75.39.15,14	α Pegasi.
	58.54.23,95				1.35,67	0,38			96.43.7,52	Uranus.
61,60	-24.30.53,56			52,7					13.15.48,31	γ Cephei R.
	-24.30.52,00				26,41				13.15.49,87	γ Cephei.

Coincidence of Micrometer Wire with fixed Wire = 10',098, 10',102, 10',106, 10',110, 10',111 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = - 8'',5.

Adopted Zenith Point = 43°.27'.0'',82.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  h. m. s.	Correction for Microm. or Time.  ' "	Concluded reading of Circle.  ° ' "	Observer.	
			A	B	C	D	E	F					
			' "	' "	' "	' "	' "	' "					
Aug. 28	$\alpha$ Ophiuchi R. M.	183.50	4.13,3	19,0	12,8	13,3	19,9	15,1	5,358	+1.39,16	183.55.53,76	G.	
	$\alpha$ Ophiuchi	82.55	3.6,0	9,9	6,8	6,2	9,8	5,0			82.58.6,58	G.	
Aug. 29	(a) $\odot$ N.L. M.	85.50	2.16,8	23,0	18,9	18,4	20,9	17,6	13,298	-1.6,57	85.51.12,18	G.	
	$\odot$ S.L.	86.20	2.53,0	59,0	53,0	54,0	57,5	52,0			86.22.54,08	G.	
	Venus N.L.	106.0	0.46,8	52,8	46,2	48,2	50,8	45,7			106.0.48,23	G.	
	Uranus	102.20	3.14,9	21,8	15,3	15,2	21,9	15,8	11,049	-19,62	102.23.16,73	G.	
	(b) $\gamma$ Cephei R. M.	247.55	3.16,0	20,2	14,8	15,8	18,4	18,0			247.57.56,83	G.	
	$\gamma$ Cephei	18.55	1.6,9	11,1	6,4	5,8	9,8	6,0			18.56.7,42	G.	
Aug. 31	(c) $\delta$ N.L. M.	67.45	0.46,0	49,0	48,0	44,7	47,0	45,2	11,048	-19,68	67.45.24,51	G.	
	$\delta$ N.L. M.	67.45	0.46,0	49,0	48,0	44,7	47,0	45,2	10,993	-18,50	67.45.26,83	G.	
	$\delta$ N.L. M.	67.45	0.46,0	49,0	48,0	44,7	47,0	45,2	11,050	-19,64	67.45.26,83	G.	
	$\delta$ N.L. M.	67.45	0.46,0	49,0	48,0	44,7	47,0	45,2	11,183	-22,31	67.45.25,30	G.	
	$\delta$ N.L. M.	67.45	0.46,0	49,0	48,0	44,7	47,0	45,2	11,261	-23,92	67.45.24,83	G.	
	Capella R. M.	217.5	0.18,4	22,2	17,4	18,5	20,6	18,1	14,204	-1.25,47	217.3.53,66	G.	
	Capella	49.50	0.9,0	11,8	8,1	8,2	11,1	8,9			49.50.9,48	G.	
	(d) $\beta$ Tauri R. M.	199.40	2.18,1	21,9	17,5	18,0	21,0	18,3	9,278	+17,46	199.42.36,00	G.	
	$\beta$ Tauri	67.10	1.25,8	28,9	26,3	23,6	27,3	25,0		+0,33	67.11.26,16	G.	
	C Tauri	68.5	0.17,0	19,8	16,0	14,3	17,2	15,5			68.5.16,57	G.	
	Sept. 2	$\odot$ S.L. M.	87.45	4.22,7	26,9	23,9	21,5	25,2	22,0	10,448	-7,08	87.49.15,62	G.
		$\odot$ N.L.	87.15	2.31,7	35,3	32,8	32,0	33,8	31,1			87.17.32,22	G.
(b) Venus N.L.		107.15	4.11,7	17,2	13,8	12,0	15,6	12,0	107.19.12,77			G.	
Sept. 4	$\alpha$ Cephei R. M.	233.5	3.21,5	26,4	19,7	20,4	22,0	21,5	9,471	+13,32	233.8.34,49	G.	
	$\alpha$ Cephei	33.45	0.30,0	33,5	27,6	27,4	27,4	29,8	10,518	-8,54	33.45.29,17	G.	
	$\beta$ Cephei R. M.	241.5	0.31,8	36,0	29,3	30,8	32,1	32,2			241.5.23,38	G.	
	$\beta$ Cephei	25.45	3.39,8	44,2	37,3	36,6	37,0	38,0			25.48.37,98	G.	
	$\alpha$ Pegasi R. M.	185.30	4.11,1	14,5	9,9	9,9	13,8	10,8	5,849	+1.28,91	185.35.39,63	G.	
	$\alpha$ Pegasi	81.15	3.22,8	27,0	22,1	20,8	24,7	22,4			81.18.22,53	G.	
	Uranus	102.25	3.45,9	51,3	45,4	43,9	46,4	44,2			102.28.45,35	G.	
Sept. 6	$\odot$ S.L. M.	89.15	4.15,0	20,4	15,5	14,0	21,7	15,0	14,619	-1.34,16	89.17.41,77	G.	
	$\odot$ N.L.	88.45	0.55,3	60,3	57,3	58,2	61,1	55,5			88.45.57,73	G.	
	(e) $\star$ $\mathcal{R}$ . 22 <sup>h</sup> . 35 <sup>m</sup> . 24 <sup>s</sup> .	29.55	4.51,8	53,6	50,8	50,1	52,5	50,4			+1,33	29.59.52,86	G.
	$\gamma$ Cephei	30.15	3.35,8	37,9	33,4	31,3	35,9	34,1	16,630	-2.16,14	30.18.33,90	G.	
	$\alpha$ U. Maj. SP. R. M.	288.35	2.22,2	25,3	21,0	22,2	21,0	23,1			288.35.5,78	G.	
	$\alpha$ Ursæ Maj. SP.	338.15	3.57,8	59,4	56,1	54,2	55,9	56,1			338.18.55,67	G.	
	Uranus	102.30	0.35,8	40,3	35,3	36,2	38,2	35,9			102.30.36,82	G.	
	Sept. 9	$\odot$ N.L. M.	89.50	4.17,1	22,9	17,6	17,9	24,8	19,3	12,680	-53,69	89.53.25,24	G.
$\odot$ S.L.		90.20	5.12,1	18,8	13,5	13,0	18,1	13,3	90.25.13,58			G.	
(f) Venus N.L.		109.10	0.25,8	33,2	26,3	28,1	29,5	26,2	109.10.28,08			G.	
$\gamma$ Draconis		44.5	4.2,6	9,4	3,0	2,3	7,5	3,8	10,792	-14,27	44.9.3,82	G.	
$\delta$ Ursæ Min. R. M.		257.45	4.22,0	27,2	20,5	20,9	21,4	23,8			257.49.7,35	G.	
$\delta$ Ursæ Minoris		9.0	4.51,6	57,1	52,5	51,2	57,1	53,1			9.4.52,62	G.	
$\star$ $\mathcal{R}$ . 18 <sup>h</sup> . 30 <sup>m</sup> . 8 <sup>s</sup> .		44.0	3.7,0	14,4	7,3	7,2	11,8	8,3			44.3.8,60	G.	
(g) $\star$ $\mathcal{R}$ . 20 <sup>h</sup> . 24 <sup>m</sup> . 9 <sup>s</sup> .		32.15	2.52,1	57,0	52,2	52,1	54,0	54,1			32.17.52,90	G.	
$\theta$ Cephei		33.10	2.30,6	36,0	28,8	29,3	31,3	33,0	12,010	-39,70	33.12.30,92	G.	
$\alpha$ Cygni R. M.		215.55	2.39,9	47,2	38,4	40,9	43,4	42,2			215.57.1,67	G.	
$\alpha$ Cygni		50.55	1.57,1	62,8	59,1	58,0	58,8	58,8			50.56.58,63	G.	
$\alpha$ Cephei R. M.		233.5	2.21,2	27,2	19,7	21,5	24,0	24,2	6,602	+1.13,19	233.8.35,61	G.	
$\alpha$ Cephei		33.45	0.24,1	30,0	24,8	25,1	25,9	27,2			33.45.26,08	G.	
$\star$ $\mathcal{R}$ . 21 <sup>h</sup> . 20 <sup>m</sup> . 3 <sup>s</sup> .		81.0	2.16,1	21,4	17,4	16,3	19,9	18,8			81.2.17,78	G.	

Coincidences at the five wires and Runs taken Sept. 2, 0<sup>h</sup>. (Temp. 60°, 4.)Coincidence at middle wire and Runs taken Sept. 10, 1<sup>h</sup>. (Temp. 66°.)

(a) N.L. too cloudy for dark glass.

(b) Very cloudy.

(c) At the five wires.

(d) At the 4th and 5th wires.

(e) At the 5th wire. No correction for runs.

(f) Much motion.

(g) Very doubtful from faintness.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.	
			Attach.	Free.							
"	° ' "	Inch.	°	°	' "	' "	"	' "	° ' "		
60,17	39.31. 7,06	29,942	61,4	59,9	47,17				77.19. 2,51	$\alpha$ Ophiuchi R.	
	39.31. 5,76								77.19. 1,21	$\alpha$ Ophiuchi.	
	42.24. 11,36	29,820	65,0	66,1	51,35	5,70	8,441	15.52,00	80.27.57,29	$\odot$ .	
	42.55.53,26				52,31	5,76			80.27.56,09	$\odot$ .	
	62.33.47,41	29,798	68,2	69,5	1.47,11	17,12		18,50	100.22.44,18	Venus.	
58.56.15,91	29,756	62,0	60,3	1.34,02	0,38			96.44.57,83	Uranus.		
62,12	-24.30.56,01			60,0	25,93				13.15.46,34	$\gamma$ Cephei R.	
	-24.30.53,40								13.15.48,95	$\gamma$ Cephei.	
	24.18.23,69	28,940	58,0	56,9					61.58. 0,39	$\delta$ .	
	24.18.26,01								61.58. 2,71	$\delta$ .	
	24.18.26,01				25,13	23.56,25	15.59,54	61.58. 2,71	$\delta$ .		
	24.18.24,48							61.58. 1,18	$\delta$ .		
	24.18.24,01							61.58. 0,71	$\delta$ .		
61,57	6.23. 7,16				6,23			44.10.21,67	Capella R.		
	6.23. 8,66							44.10.23,17	Capella.		
61,08	23.44.24,82			56,7	24,48				61.31.57,58	$\beta$ Tauri R.	
	23.44.25,34								61.31.58,10	$\beta$ Tauri.	
	24.38.15,75			57,5	25,49				62.25.49,52	C Tauri.	
	44.22.14,80	29,108	61,0	61,5	54,19	5,92	8,278	20,44	81.54.18,45	$\odot$ .	
	43.50.31,40				53,20	5,86			81.54.19,92	$\odot$ .	
	63.52.11,95				60,6	59,3			1.52,98	18,46	101.41.15,19
61,83	-9.41.33,67	29,842	55,5	52,9	9,88				28. 5.24,73	$\alpha$ Cephei R.	
	-9.41.31,65								28. 5.26,75	$\alpha$ Cephei.	
60,68	-17.38.22,56				18,39				20. 8.27,33	$\beta$ Cephei R.	
	-17.38.22,84								20. 8.27,05	$\beta$ Cephei.	
61,08	37.51.21,19	29,834	51,8	50,7	45,12				75.39.14,59	$\alpha$ Pegasi R.	
	37.51.21,71							75.39.15,11	$\alpha$ Pegasi.		
	59. 1.44,53				1.36,47	0,38	96.50.28,90	Uranus.			
	45.50.40,95	29,950	63,6	64,0	58,39	6,08	8,144	22,21	15.53,80	83.22.47,74	$\odot$ .
	45.18.56,91				57,33	6,02			83.22.50,30	$\odot$ .	
	-13.27. 7,96	29,940	57,2	55,5	13,81				24.19.46,51	* $\mathcal{R}$ .22 <sup>h</sup> .35 <sup>m</sup> .24 <sup>s</sup>	
	-13. 8.26,92				13,48				24.38.27,88	$\gamma$ Cephei.	
	-65. 8. 4,96		57,0	55,2	2. 3,95				-27.23. 0,63	$\alpha$ Ur. Maj. SP. R.	
60,73	-65. 8. 5,15				1.36,04	0,38			-27.23. 0,82	$\alpha$ Ursæ Maj. SP.	
	59. 3.36,00								96.52.19,94	Uranus.	
	46.26.24,42	29,910	67,1	68,0	59,07	6,15	8,144	22,21	15.54,60	84.30.20,22	$\odot$ .
	46.58.12,76				1. 0,17	6,20			84.30.20,41	$\odot$ .	
	65.43.27,26	29,900	69,0	69,4	2. 3,57	21,00			103.32.40,32	Venus.	
	0.42. 3,00	29,888	63,6	62,6	0,70				38.29.11,98	$\gamma$ Draconis.	
	-34.22. 6,53		62,8	61,5	38,92				3.24.22,83	$\delta$ Ursæ Min. R.	
59,99	-34.22. 8,20								3.24.21,16	$\delta$ Ursæ Minoris.	
	0.36. 7,78				0,60				38.23.16,66	* $\mathcal{R}$ .18 <sup>h</sup> .30 <sup>m</sup> .8 <sup>s</sup> .	
	-11. 9. 7,92		60,4	58,9	11,28				26.37.49,08	* $\mathcal{R}$ .20 <sup>h</sup> .24 <sup>m</sup> .9 <sup>s</sup> .	
	-10.14.29,90				10,34				27.32.28,04	$\theta$ Cephei.	
	7.29.59,15				7,54				45.17.14,97	$\alpha$ Cygni R.	
60,15	7.29.57,81								45.17.13,63	$\alpha$ Cygni.	
	-9.41.34,79				9,78				28. 5.23,71	$\alpha$ Cephei R.	
60,85	-9.41.34,74								28. 5.23,76	$\alpha$ Cephei.	
	37.35.16,96				44,03				75.23. 9,27	* $\mathcal{R}$ .21 <sup>h</sup> .20 <sup>m</sup> .3 <sup>s</sup> .	

Coincidence of Micrometer Wire with fixed Wire from Aug. 28 = 10',105, 10',107, 10',109, 10',114, 10',115 at the five Wires. From Sept. 6 = 10',108 at the middle Wire.

One Micrometer Revolution = 20'',873.

Correction for Runs from Aug. 28 = -6'',8. From Sept. 6 = -7'',0.

Adopted Zenith Point = 43°.27'.0'',82.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR  or  PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  ". h. m. s.	Correction for Microm. or Time.  " "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			" "	" "	" "	" "	" "	" "				
Sept. 9	β Cephei R. M....	241. 0	4. 15,6	20,4	14,4	16,0	18,3	19,1	6,842	+1. 8,17	241. 5. 24,47	G.
	β Cephei.....	25. 45	3. 36,0	41,3	36,6	35,9	37,7	37,1			25. 48. 36,60	G.
	Uranus.....	102. 30	3. 22,8	29,0	23,1	24,0	26,4	25,1			102. 33. 24,27	G.
Sept. 10	(a) ☉ S.L. M.....	90. 45	3. 31,1	34,3	30,8	30,7	36,9	30,9	11,874	- 36,86	90. 47. 54,77	G.
	☉ N.L.....	90. 15	1. 5,0	9,8	7,0	7,5	11,4	4,8			90. 16. 7,33	G.
	Venus N.L.....	109. 20	3. 3,4	10,7	4,0	6,0	8,2	3,2			109. 23. 5,20	G.
Sept. 12	(b) α Pegasi R. M....	185. 30	4. 23,0	29,0	22,8	23,1	25,9	25,4	6,469	+1. 15,96	185. 35. 39,79	G.
	(b) α Pegasi.....	81. 15	3. 20,0	25,2	22,4	19,2	22,3	21,1			81. 18. 20,92	G.
	Uranus.....	102. 35	1. 6,8	14,5	9,5	9,4	11,8	7,0			102. 36. 9,57	G.
Sept. 13	(c) ☉ N.L. M.....	91. 25	1. 7,8	11,1	9,5	9,9	12,9	6,8	14,194	-1. 25,29	91. 24. 44,11	G.
	☉ S.L.....	91. 55	1. 32,8	35,1	31,0	33,3	36,3	31,3			91. 56. 32,95	G.
	δ Ursæ Min. R. M.	257. 50	0. 18,3	23,9	18,8	19,3	20,8	19,9	13,560	-1. 12,05	257. 49. 8,05	G.
	(d) δ Ursæ Minoris...	9. 0	4. 51,2	56,2	53,9	52,9	53,9	50,9			9. 4. 53,17	G.
	α Lyræ R. M....	209. 50	3. 15,7	24,0	17,5	17,4	18,4	16,5	11,459	- 28,19	209. 52. 49,29	G.
	α Lyræ.....	57. 0	1. 11,2	15,5	12,2	10,4	12,3	11,0			57. 1. 11,82	G.
	(e) Uranus.....	102. 35	2. 3,4	8,9	5,9	4,5	6,2	3,2	- 0,09	102. 37. 4,78	G.	
Sept. 14	(f) ☉ S.L. M.....	92. 20	1. 20,7	23,2	20,4	21,8	22,3	19,9	15,252	-1. 47,37	92. 19. 33,71	G.
	☉ N.L.....	91. 45	2. 42,7	48,2	44,0	44,0	47,3	42,2			91. 47. 44,10	G.
Sept. 15	(g) ♃ N.L. M.....	124. 20	4. 44,6	50,0	44,3	45,3	47,3	44,2	9,697	+ 8,56}	124. 24. 55,21	G.
										+ 1,70}		
	♃ N.L. M.....	124. 20	4. 44,6	50,0	44,3	45,3	47,3	44,2	9,692	+ 8,79}	124. 24. 54,59	G.
										+ 0,85}		
	♃ N.L. M.....	124. 20	4. 44,6	50,0	44,3	45,3	47,3	44,2	9,580	+ 11,17	124. 24. 56,12	G.
Sept. 16 Sept. 18	♃ N.L. M.....	124. 20	4. 44,6	50,0	44,3	45,3	47,3	44,2	9,422	+ 14,61}	124. 24. 57,86	G.
										- 1,70}		
	(h) Venus N.L. ....	110. 15	2. 25,0	32,0	25,0	26,6	29,9	26,0	10,828	- 14,88	110. 17. 26,90	G.
	(i) ☉ S.L. M.....	93. 50	2. 21,1	26,1	22,0	22,8	24,9	21,0	10,828	- 14,88	93. 52. 7,59	G.
	☉ N.L.....	93. 20	0. 14,9	20,2	15,4	16,4	18,3	13,8			93. 20. 16,43	G.
	Venus N.L.....	110. 25	1. 12,8	20,5	14,5	14,0	17,2	12,8	10,205	- 5,40	110. 26. 15,05	G.
	(k) ♃ S.L. ....	121. 20	3. 59,3	64,9	59,8	58,6	62,8	57,6			121. 23. 54,25	G.
	♃ S.L. M.....	121. 20	3. 59,3	64,9	59,8	58,6	62,8	57,6	10,373	- 1,92}	121. 23. 55,03	G.
										- 2,70}		
Sept. 19	♃ S.L. M.....	121. 20	3. 59,3	64,9	59,8	58,6	62,8	57,6	10,373	- 5,38	121. 23. 54,27	G.
	♃ S.L. M.....	121. 20	3. 59,3	64,9	59,8	58,6	62,8	57,6	10,529	- 8,60}	121. 23. 53,75	G.
										+ 2,70}		
	♃ S.L. M.....	121. 20	3. 59,3	64,9	59,8	58,6	62,8	57,6	10,672	- 11,48}	121. 23. 53,57	G.
										+ 5,40}		
	α U. Maj. SP. R. M.	288. 35	2. 16,9	21,1	17,5	18,0	15,1	18,7	16,111	-2. 5,17	288. 35. 12,23	G.
	α Ursæ Majoris SP.	338. 15	3. 50,1	54,0	50,8	48,3	52,6	50,5			338. 18. 50,23	G.
	γ Cephei R. M....	247. 55	3. 22,5	27,8	20,8	21,5	23,1	24,0	11,069	- 19,91	247. 58. 2,66	G.
	γ Cephei.....	18. 55	0. 59,0	63,1	61,0	57,8	59,8	59,1			18. 55. 59,75	G.
	Mercury, center...	86. 10	3. 53,8	57,8	54,5	53,9	57,0	52,4	12,520	- 50,20	86. 13. 54,07	G.
	☉ N.L. M.....	93. 40	4. 21,2	25,2	21,3	19,8	25,0	20,0			93. 43. 30,95	G.
	☉ S.L.....	94. 15	0. 22,1	27,4	23,9	24,5	25,8	21,8	10,973	- 17,91	94. 15. 24,17	G.
	π Capricorni M....	114. 20	1. 22,3	27,8	24,8	24,8	27,8	24,7			114. 21. 7,16	G.
	λ Ursæ Min. R. M.	260. 0	4. 17,1	23,2	17,9	18,2	22,2	21,0	13,100	-1. 2,31	260. 3. 16,69	G.
	λ Ursæ Minoris...	6. 50	0. 43,5	47,9	45,5	43,8	47,0	45,9			6. 50. 45,43	G.
	α Cygni R. M....	215. 55	2. 16,0	21,9	17,0	17,1	19,9	18,1	10,814	- 14,59	215. 57. 3,24	G.
	α Cygni.....	50. 55	1. 55,9	61,0	57,2	55,1	58,0	56,4			50. 56. 56,85	G.
	(l) ♃ S.L.....	117. 10	1. 17,8	24,5	19,7	18,8	21,8	18,7	10,308	- 7,28	117. 11. 12,65	G.
										- 4,07}		
	♃ S.L. M.....	117. 10	1. 17,8	24,5	19,7	18,8	21,8	18,7	10,537	- 3,64}	117. 11. 12,22	G.
										- 8,81}		
	♃ S.L. M.....	117. 10	1. 17,8	24,5	19,7	18,8	21,8	18,7	10,729	- 12,77}	117. 11. 11,12	G.
										+ 3,64}		
	♃ S.L. M.....	117. 10	1. 17,8	24,5	19,7	18,8	21,8	18,7	10,828	- 14,74}	117. 11. 10,80	G.
										+ 7,28}	117. 11. 12,47	G.

Coincidences at the five wires and Runs taken Sept. 18, 22<sup>h</sup>. 30<sup>m</sup>. (Temp. 57°.)

- (a) Misty. (b) Bad definition in both.  
(c) N.L. doubtful, without dark glass.  
(d) No correction for runs.  
(e) At the 5th wire. Correction for change of N.P.D. = - 0",02. (f) Without dark glass; unsatisfactory.

- (g) At the 1st, 2nd, 3rd and 5th wires; extremely faint.  
(h) Good.  
(i) Very bad definition and much waving.  
(k) At the five wires; misty and faint, but steady.  
(l) At the five wires.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
60,54	-17.38.23,65	29,888	60,4	58,9	18,20				20.8.26,43	$\beta$ Cephei R.
	-17.38.24,22								20.8.25,86	$\beta$ Cephei.
	59.6.23,45	29,850	59,6	58,8	1.35,23	0,38			96.55.6,58	Uranus.
	47.20.53,95	29,992	64,0	64,8	1.1,52	6,24		15.54,80	84.53.2,71	$\odot$ .
	46.49.6,51				1.0,40	6,18			84.53.3,81	$\odot$ .
60,35	65.56.4,38	30,028	64,7	65,6	2.6,26	21,37	8,072	23,09	103.45.20,64	Venus.
	37.51.21,03	29,612	55,6	54,7					75.39.13,73	$\alpha$ Pegasi R.
	37.51.20,10				44,42				75.39.12,80	$\alpha$ Pegasi.
	59.9.8,75				1.35,44	0,38			96.57.52,09	Uranus.
	47.57.43,29	29,532	59,4	58,3	1.2,71	6,31		15.55,60	86.1.43,57	$\odot$ .
60,61	48.29.32,13				1.3,88	6,36			86.1.42,33	$\odot$ .
	-34.22.7,23	29,434	57,2	55,0					3.24.22,22	$\delta$ Ursæ Min. R.
60,56	-34.22.7,65				38,83				3.24.21,80	$\delta$ Ursæ Minoris.
	13.34.11,53								51.21.33,52	$\alpha$ Lyræ R.
	13.34.11,00				13,71				51.21.32,99	$\alpha$ Lyræ.
	59.10.3,96	29,340	54,0	52,8	1.34,98	0,38			96.58.46,84	Uranus.
	48.52.32,89	29,100	58,5	58,7	1.3,75	6,40		15.55,90	86.24.42,62	$\odot$ .
	48.20.43,28				1.2,58	6,35			86.24.43,69	$\odot$ .
	80.57.54,39	29,142	59,5	58,8					118.11.38,44	$\odot$ .
	80.57.53,77								118.11.37,82	$\odot$ .
	80.57.55,30				5.36,05	53.55,05		14.54,77	118.11.39,35	$\odot$ .
	80.57.57,04								118.11.41,09	$\odot$ .
	66.50.26,08	29,300	58,6	58,9	2.10,31	23,63	8,080	23,56	104.39.44,60	Venus.
	50.25.6,77	29,446	58,7	59,0	1.8,07	6,55		15.56,90	87.57.19,67	$\odot$ .
	49.53.15,61				1.6,81	6,50			87.57.21,10	$\odot$ .
	66.59.14,23	29,450	60,0	60,4	2.11,50	24,36	7,969	25,11	104.48.34,76	Venus.
	77.56.53,43	29,504	55,0	51,8					114.37.22,68	$\odot$ .
	77.56.54,21								114.37.23,46	$\odot$ .
	77.56.53,45				4.21,87	55.30,58		15.30,32	114.37.22,70	$\odot$ .
	77.56.52,93								114.37.22,18	$\odot$ .
	77.56.52,75								114.37.22,00	$\odot$ .
	-65.8.11,41	29,496	52,0	50,6	2.3,28				-27.23.6,41	$\alpha$ U. Maj. SP. R.
61,23	-65.8.10,59								-27.23.5,59	$\alpha$ Ursæ Maj. SP.
	-24.31.1,84		51,8	50,4					13.15.40,23	$\gamma$ Cephei R.
61,21	-24.31.1,07				26,21				13.15.41,00	$\gamma$ Cephei.
	42.46.53,25	29,432	57,5	57,5	52,25	5,99			80.34.47,79	Mercury.
	50.16.30,13	29,428	58,6	59,4	1.7,64	6,54		15.57,20	88.20.36,71	$\odot$ .
	50.48.23,35				1.8,92	6,59			88.20.36,76	$\odot$ .
	70.54.6,34	29,450	54,0	52,9	2.43,25				108.43.57,87	$\pi$ Capricorni.
	-36.36.15,87								1.10.10,03	$\lambda$ Ursæ Min. R.
	-36.36.15,39				42,38				1.10.10,51	$\lambda$ Ursæ Minoris.
61,06	7.29.57,58								45.17.13,38	$\alpha$ Cygni R.
	7.29.56,03				7,52				45.17.11,83	$\alpha$ Cygni.
60,05	73.44.11,83	29,460	53,7	51,7					110.23.25,50	$\odot$ .
	73.44.11,40								110.23.25,07	$\odot$ .
	73.44.10,30				3.13,53	55.22,47		15.45,67	110.23.23,97	$\odot$ .
	73.44.9,98								110.23.23,65	$\odot$ .
	73.44.11,65								110.23.25,32	$\odot$ .

Coincidence of Micrometer Wire with fixed Wire = 10',108, at the middle wire. From Sept. 15 = 10',107, 10',113, 10',115, 10',117, 10',122 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = -7'',0. From Sept. 15 = -6'',4.

Adopted Zenith Point = 43°.27'.0'',82.

Assumed Co-latitude 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  r. h. m. s.	Correction for Microm. or Time.  ' "	Concluded reading of Circle.  ° ' "	Observer.		
			A	B	C	D	E	F						
			"	"	"	"	"	"						
Sept. 19	(a) α Pegasi R. M. . . . .	185.35	0.23,8	28,8	24,7	25,4	27,8	26,4	9,378	+ 15,39	185.35.41,44	G.		
	α Pegasi . . . . .	81.15	3.19,1	24,2	20,6	19,4	24,7	23,2			81.18.21,15	G.		
	Uranus. . . . .	102.40	2.26,0	30,6	25,9	26,3	27,8	25,9			102.42.26,57	G.		
	γ Cephei R. M. . . . .	247.55	3.16,1	22,2	17,0	16,8	19,8	18,9			247.58.3,22	G.		
	γ Cephei . . . . .	18.55	0.57,2	63,8	59,5	57,6	58,5	58,2	10,812	- 14,55	18.55.58,95	G.		
	* R. 23 <sup>h</sup> . 53 <sup>m</sup> . 39 <sup>s</sup> . . .	31.5	1.22,8	26,4	22,3	21,4	24,4	24,1			31.6.23,27	G.		
	(b) * R. 23 <sup>h</sup> . 54 <sup>m</sup> . 16 <sup>s</sup> . .	32.0	1.11,9	16,8	13,9	12,8	14,4	14,7			+ 1,21	32.1.15,04	G.	
	(c) * R. 23 <sup>h</sup> . 56 <sup>m</sup> . 54 <sup>s</sup> . .	31.45	1.40,5	44,6	41,0	40,0	42,9	42,2			+ 0,31	31.46.41,81	G.	
	* R. 23 <sup>h</sup> . 58 <sup>m</sup> . 7 <sup>s</sup> . . . .	32.20	1.43,0	48,8	45,0	43,9	47,5	45,4	7,107	+ 1. 2,79	32.21.45,23	G.		
	α Cassiopeia R. M. . . . .	226.50	2.33,2	40,3	34,0	34,9	37,8	35,8			226.53.38,24	G.		
	α Cassiopeia . . . . .	40.0	0.24,8	29,9	26,6	24,8	28,3	25,9			40.0.26,62	G.		
	Polaris R. M. . . . .	259.40	1.26,0	31,4	26,8	27,8	31,9	29,7			259.40.42,82	G.		
	Polaris. . . . .	7.10	3.20,2	22,8	21,7	18,7	21,5	21,0	12,309	- 45,80	7.13.20,27	G.		
	Juno. . . . .	94.10	4.7,0	12,9	10,5	7,9	11,2	8,1			94.14.8,72	G.		
	Mercury, center. . . . .	86.25	4.2,5	7,0	3,4	2,4	5,1	0,4			86.29.2,60	G.		
	α Ursæ Maj. R. M. . . . .	233.50	2.16,1	20,6	16,8	15,0	19,8	16,8			233.50.54,45	G.		
	α Ursæ Majoris. . . . .	33.0	3.8,1	15,3	8,9	7,8	14,4	8,0	14,071	- 1.22,58	33.3.9,75	G.		
Sept. 20	(d) ☉ N.L. M. . . . .	94.5	2.22,1	27,9	23,8	23,2	26,6	22,1	11,730	- 33,70	94.6.50,07	G.		
	☉ S.L. . . . .	94.35	3.40,0	47,5	42,2	41,4	46,4	40,2			94.38.42,17	G.		
Sept. 21	(e) * R. 20 <sup>h</sup> . 24 <sup>m</sup> . 9 <sup>s</sup> . . .	32.15	2.42,1	48,5	44,0	42,8	45,3	45,1	11,192	- 22,48	32.17.44,05	G.		
	θ Cephei. . . . .	33.10	2.27,2	34,0	28,3	27,5	29,0	30,4			33.12.28,87	G.		
	α Cygni R. M. . . . .	215.55	2.26,1	31,9	26,8	27,0	28,2	29,0			215.57.5,17	G.		
	α Cygni. . . . .	50.55	1.56,1	60,9	57,5	55,2	57,4	57,7			50.56.57,05	G.		
	α Cephei R. M. . . . .	233.5	2.16,1	22,2	17,8	17,8	21,3	20,8	6,238	+ 1.20,93	233.8.39,76	G.		
	α Cephei . . . . .	33.45	0.22,1	27,2	23,8	23,0	24,3	25,2			33.45.24,18	G.		
	* R. 21 <sup>h</sup> . 20 <sup>m</sup> . 3 <sup>s</sup> . . . .	81.0	2.17,3	20,5	19,0	16,1	21,5	19,9			81.2.18,55	G.		
	β Cephei R. M. . . . .	241.5	0.24,8	30,0	24,9	26,3	26,8	28,0	10,010	+ 2,19	241.5.28,91	G.		
	β Cephei. . . . .	25.45	3.32,3	36,2	33,0	30,9	35,8	34,2			25.48.32,98	G.		
	υ Ursæ Maj. SP. . . . .	291.25	1.12,9	18,0	14,4	14,8	14,9	16,1			291.24.31,73	G.		
	R. M. . . . .	335.25	4.32,5	36,1	32,4	30,4	35,2	34,2	15,059	- 1.43,19	335.29.32,50	G.		
	υ Ursæ Majoris SP. . . . .	104.10	2.46,4	51,3	48,7	47,1	48,1	47,9			104.12.47,65	G.		
	θ Aquarii. . . . .	107.5	2.33,7	38,2	36,9	33,8	37,3	36,0			107.7.35,43	G.		
	α Aquarii. . . . .	105.10	0.0,3	4,3	4,0	2,5	4,5	1,2			105.9.53,20	G.		
	(f) S.L. . . . .	105.10	0.0,3	4,3	4,0	2,5	4,5	1,2	10,321	- 9,58 - 4,34 - 4,79	105.9.53,65	G.		
	» S.L. M. . . . .	105.10	0.0,3	4,3	4,0	2,5	4,5	1,2			105.9.53,15	G.		
	» S.L. M. . . . .	105.10	0.0,3	4,3	4,0	2,5	4,5	1,2			105.9.52,46	G.		
	» S.L. M. . . . .	105.10	0.0,3	4,3	4,0	2,5	4,5	1,2			105.9.52,61	G.		
	α Ursæ Maj. SP. . . . .	288.35	2.12,9	18,4	14,4	14,9	15,4	15,9	16,008	- 2. 3,01	288.35.11,82	G.		
	R. M. . . . .	338.15	3.47,9	54,4	50,6	48,3	52,1	51,0			338.18.49,90	G.		
	α Ursæ Majoris SP. . . . .	102.40	4.10,0	14,9	12,5	9,0	14,0	10,8			102.44.10,98	G.		
	φ Aquarii. . . . .	102.30	2.49,8	55,1	52,4	49,7	51,8	51,8			102.32.51,17	G.		
	κ <sup>1</sup> Piscium. . . . .	95.15	0.43,2	47,8	45,8	44,3	45,9	45,4	10,010	+ 2,19	95.15.45,25	G.		
	δ App. Sculp. . . . .	124.30	4.45,4	50,4	46,8	44,3	50,1	45,5			124.34.46,08	G.		
	* R. 23 <sup>h</sup> . 54 <sup>m</sup> . 16 <sup>s</sup> . . .	32.0	1.13,0	18,2	15,4	14,1	14,0	16,5			32.1.14,93	G.		
	* R. 23 <sup>h</sup> . 56 <sup>m</sup> . 54 <sup>s</sup> . . .	31.45	1.40,2	44,1	41,9	39,5	41,7	42,1			31.46.41,22	G.		
	* R. 23 <sup>h</sup> . 58 <sup>m</sup> . 7 <sup>s</sup> . . . .	32.20	1.45,0	49,0	47,8	45,1	46,4	47,8	10,010	+ 2,19	32.21.46,48	G.		
	(g) Juno. . . . .	94.35	4.30,2	34,8	34,8	30,0	32,7	32,9			94.39.31,60	G.		
Sept. 22	φ Aquarii. . . . .	102.30	2.47,8	54,0	50,9	49,4	51,0	49,5	16,068	- 2. 4,26	102.32.49,83	G.		
	κ <sup>1</sup> Piscium. . . . .	95.15	0.42,2	48,0	44,5	44,0	46,0	43,7			95.15.44,58	G.		
	γ Cephei R. M. . . . .	248.0	0.8,0	14,1	9,8	10,0	11,1	10,2			247.58.6,24	G.		
	γ Cephei. . . . .	18.55	0.55,0	61,3	58,2	55,5	59,4	56,3			18.55.57,40	G.		

- (a) Bad blur.  
 (b) At the 5th wire.  
 (c) At the 4th wire.  
 (d) Without the dark glass; not good.

- (e) Most probably the star observed on Aug. 10.  
 The pointer reading was written down 32°.20'.  
 (f) At the five wires.  
 (g) Faint.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
61,30	37.51.19,38 37.51.20,33 59.15.25,75	29,468	51,8	50,5	44,58 1.36,18	0,38			75.39.12,24 75.39.13,19 97.4.9,83	$\alpha$ Pegasi R. $\alpha$ Pegasi. Uranus.
61,09	-24.31.2,40 -24.31.1,87 -12.20.37,55 -11.25.45,78 -11.40.19,01 -11.5.15,59				26,18 12,56 11,60 11,86 11,25				13.15.39,70 13.15.40,23 25.26.18,17 26.21.10,90 26.6.37,41 26.41.41,44	$\gamma$ Cephei R. $\gamma$ Cephei. * $\mathcal{R}$ .23 <sup>h</sup> .53 <sup>m</sup> .39 <sup>s</sup> * $\mathcal{R}$ .23 <sup>h</sup> .54 <sup>m</sup> .16 <sup>s</sup> * $\mathcal{R}$ .23 <sup>h</sup> .56 <sup>m</sup> .54 <sup>s</sup> * $\mathcal{R}$ .23 <sup>h</sup> .58 <sup>m</sup> .7 <sup>s</sup> .
62,43	-3.26.37,42 -3.26.34,20				3,45				34.20.27,41 34.20.30,63	$\alpha$ Cassiopeiae R. $\alpha$ Cassiopeiae.
61,55	-36.13.42,00 -36.13.40,55 50.47.7,90 43.2.1,78		51,0	49,3	42,13 1.10,40	5,71			1.32.44,15 1.32.45,60 88.35.20,87	Polaris R. Polaris. Juno.
62,10	-10.23.53,63 -10.23.51,07	29,544	58,0	58,7	52,79 10,38	5,85			80.49.57,00 27.23.4,27 27.23.6,83	Mercury. $\alpha$ Ursae Maj. R. $\alpha$ Ursae Majoris.
	50.39.49,25 51.11.41,35	29,540	59,5	59,9	1.8,77 1.10,08	6,58 6,63		15.57,50	88.43.57,22 88.43.55,58	$\odot$ . $\odot$ .
61,11	-11.9.16,77 -10.14.31,95 7.29.55,65 7.29.56,23	29,496	52,8	49,5	11,36 10,39 7,58				26.37.40,15 27.32.25,94 45.17.11,51 45.17.12,09	* $\mathcal{R}$ .20 <sup>h</sup> .24 <sup>m</sup> .9 <sup>s</sup> . $\theta$ Cephei. $\alpha$ Cygni R. $\alpha$ Cygni.
61,97	-9.41.38,94 -9.41.36,64 37.35.17,73				9,83 44,29				28.5.19,51 28.5.21,81 75.23.10,30	$\alpha$ Cephei R. $\alpha$ Cephei. * $\mathcal{R}$ .21 <sup>h</sup> .20 <sup>m</sup> .3 <sup>s</sup> .
60,95	-17.38.28,09 -17.38.27,84				18,31				20.8.21,88 20.8.22,13	$\beta$ Cephei R. $\beta$ Cephei.
62,12	-67.57.30,91 -67.57.28,32 60.45.46,83 63.40.34,61 61.42.52,38 61.42.52,83 61.42.52,33 61.42.51,64 61.42.51,79				2.21,19 1.42,65 1.56,01				-30.12.43,82 -30.12.41,23 98.34.37,76 101.29.38,90 98.23.13,69 98.23.14,14 98.23.13,64 98.23.12,95 98.23.13,10	$\nu$ Ursae Majoris SP. R. $\nu$ Ursae Maj. SP. $\theta$ Aquarii. $\sigma$ Aquarii. J). J). J). J). J).
60,86	-65.8.11,00 -65.8.10,92 59.17.10,16 59.5.50,35 51.48.44,43 81.7.45,26 -11.25.45,89 -11.40.19,60 -11.5.14,34 51.12.30,78	29,512	51,3	48,9 48,7	1.42,65 1.56,01 1.46,78	52.18,96		16.14,79	98.23.13,64 98.23.12,95 98.23.13,10 -27.23.6,55 -27.23.6,47 97.5.54,86 96.54.34,71 89.37.5,93 119.0.47,71 26.21.10,71 26.6.36,75 26.41.42,62 89.0.45,21	$\alpha$ Ursae Majoris SP. R. $\alpha$ Ursae Maj. SP. Uranus. $\phi$ Aquarii. $\kappa^1$ Piscium. $\delta$ App. Sculp. * $\mathcal{R}$ .23 <sup>h</sup> .54 <sup>m</sup> .16 <sup>s</sup> . * $\mathcal{R}$ .23 <sup>h</sup> .56 <sup>m</sup> .54 <sup>s</sup> . * $\mathcal{R}$ .23 <sup>h</sup> .58 <sup>m</sup> .7 <sup>s</sup> . Juno.
	59.5.49,01 51.48.43,76 -24.31.5,42 -24.31.3,42	29,608	53,8	50,8	1.35,98 1.13,14 26,29	0,38			96.54.33,27 89.37.5,18 13.15.36,57 13.15.38,57	$\phi$ Aquarii. $\kappa^1$ Piscium. $\gamma$ Cephei R. $\gamma$ Cephei.

Coincidence of Micrometer Wire with fixed Wire = 10', 107, 10', 113, 10', 115, 10', 117, 10', 122 at the five wires.

One Micrometer Revolution = 20'', 873.

Correction for Runs = - 6'', 4.

Adopted Zenith Point = 43°. 27'. 0'', 82.

Assumed Co-latitude = 37°. 47'. 8'', 28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.	Microscopes.						Micrometer, or Time by Molyneux.	Correction for Microm. or Time.	Concluded reading of Circle.	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
Sept. 22	(a) S.L. M.....	97.55	0.55,0	61,3	58,9	58,0	61,0	57,2	88,024	+4.12,21 -10,02	98.0.0,54	G.
	» S.L. M.....	97.55	0.55,0	61,3	58,9	58,0	61,0	57,2	88,274	+4.7,13 -5,01	98.0.0,47	G.
	» N.L.....	97.25	1.41,2	47,3	44,0	42,8	44,2	42,8			97.26.43,35	G.
	» N.L. M.....	97.25	1.41,2	47,3	44,0	42,8	44,2	42,8	10,349	-4,84 +5,01	97.26.43,52	G.
	» N.L. M.....	97.25	1.41,2	47,3	44,0	42,8	44,2	42,8	10,683	-11,71 +10,02	97.26.41,66	G.
	(b) ω Piscium.....	89.40	0.3,0	9,1	7,4	5,1	7,5	5,0			89.40.6,17	G.
	(c) * R. 23 <sup>h</sup> . 54 <sup>m</sup> . 16 <sup>s</sup> .	32.0	1.10,2	14,7	12,6	10,2	14,0	12,0			32.1.12,03	G.
	α Androm. R. M...	199.25	1.8,9	17,0	12,8	12,8	15,2	12,2	7,724	+49,91	199.27.2,81	G.
	α Andromedæ ....	67.25	1.55,0	58,2	57,4	54,1	58,9	55,5			67.26.56,12	G.
	γ Pegasi R. M. ...	185.30	1.22,4	28,2	24,8	25,8	27,0	26,9	6,818	+1.8,82	185.32.34,37	G.
	γ Pegasi.....	81.20	1.20,2	24,2	23,0	21,2	22,9	22,6			81.21.22,07	G.
	d Piscium.....	88.20	0.41,8	47,1	44,3	43,8	47,3	43,0			88.20.44,40	G.
Sept. 23	(d) ☉ N.L. M.....	95.15	2.14,0	20,8	17,2	17,0	21,0	16,1	11,373	-26,35	95.16.50,85	G.
	☉ S.L. ....	95.45	3.43,3	48,8	45,0	43,8	49,3	43,8			95.48.44,87	G.
	(e) Venus N.L.....	110.20	4.42,0	48,1	42,0	42,3	47,8	42,3			110.24.43,08	G.
	Polaris SP. R. M..	262.45	2.18,1	22,2	18,5	18,8	20,3	19,9	13,607	-1.13,00	262.46.6,13	G.
	Polaris SP. ....	4.5	2.55,0	58,2	57,8	54,4	62,2	55,2			4.7.56,50	G.
	Uranus.....	102.45	0.51,3	60,0	54,4	55,0	55,6	52,2			102.45.54,57	G.
	d Piscium.....	88.20	0.42,5	47,1	45,0	45,2	46,1	44,8			88.20.44,97	G.
	κ Draco. SP. R. M.	280.30	3.22,8	28,3	22,9	23,8	26,0	25,4	13,375	-1.8,14	280.32.16,01	G.
	κ Draconis SP. ...	346.20	1.45,9	50,1	47,0	45,1	47,1	45,9			346.21.46,48	G.
	α Cassiopeiæ R. M.	226.50	2.15,0	20,9	15,9	15,9	17,9	16,5	6,168	+1.22,38 -0,91	226.53.38,91	G.
	(f) α Cassiopeiæ.....	40.0	0.23,4	28,2	24,9	22,5	26,0	23,5		+0,22	40.0.24,89	G.
	(g) » N.L.....	90.0	2.56,8	63,5	60,1	57,9	62,3	58,2		+10,00	90.3.9,17	G.
	ε Piscium.....	88.35	2.7,8	11,7	10,2	8,3	9,8	8,2			88.37.8,88	G.
	Polaris R. M.....	259.40	1.27,1	33,2	27,2	28,3	29,9	29,8	12,260	-44,88	259.40.44,05	G.
Sept. 24	Polaris.....	7.10	3.18,8	22,9	20,5	17,1	22,2	19,0			7.13.19,38	G.
	η Piscium.....	81.5	2.51,8	54,9	55,0	50,5	53,2	51,4			81.7.52,18	G.
	☉ S.L. M.....	96.10	2.18,5	23,3	19,6	18,0	24,4	19,3	10,698	-12,28	96.12.7,60	G.
	☉ N.L. ....	95.40	0.10,8	17,0	13,4	13,2	16,6	11,0			95.40.13,60	G.
	Polaris SP. R. M.	262.45	2.17,8	21,2	18,5	17,0	22,3	19,0	13,567	-1.12,16	262.46.6,51	G.
	Polaris SP. ....	4.5	2.53,9	58,0	56,2	53,8	61,3	54,4			4.7.55,47	G.
Sept. 25	(h) Venus N.L.....	110.10	4.2,0	9,2	3,8	3,3	8,0	2,2			110.14.3,63	G.
	Polaris SP. R. M.	262.45	2.20,9	23,8	20,2	19,2	22,8	22,2	13,707	-1.15,09	262.46.5,79	G.
	Polaris SP. ....	4.5	2.53,8	57,9	56,5	53,2	61,3	54,1			4.7.55,33	G.
	β Lyræ R. M.....	204.20	4.13,9	20,7	14,4	14,8	17,1	16,4	6,681	+1.11,58	204.25.26,65	G.
	β Lyræ.....	62.25	3.30,1	39,4	30,0	29,8	35,9	33,3			62.28.32,12	G.
	λ Ursæ Min. R. M.	260.0	4.10,9	17,0	11,4	11,2	16,4	15,0	12,761	-55,24	260.3.17,26	G.
	λ Ursæ Minoris...	6.50	0.41,4	47,2	43,0	42,2	46,0	44,8			6.50.43,90	G.
	(i) Mercury, center...	89.10	0.13,4	19,0	15,0	15,0	18,5	15,6			89.10.16,00	G.
	☉ S.L. M.....	97.0	0.13,1	19,0	14,8	15,3	18,1	13,4	13,882	-1.18,73	96.58.56,80	G.
	☉ N.L.....	96.25	1.58,9	66,0	59,8	59,8	64,9	58,9			96.27.0,83	G.
	δ Ursæ Min. R. M.	257.50	0.18,7	25,5	18,9	19,9	21,8	21,8	13,552	-1.11,84	257.49.9,18	G.
	(k) δ Ursæ Minoris...	9.0	4.50,5	55,2	50,7	50,3	55,0	50,2			9.4.52,02	G.
	α Lyræ R. M.....	209.50	3.11,6	18,9	12,0	13,3	16,6	12,8	11,224	-23,25	209.52.50,08	G.
	α Lyræ.....	57.0	1.9,1	14,2	9,7	8,8	12,3	9,8			57.1.10,35	G.
Sept. 26	β Lyræ R. M.....	204.25	0.21,0	27,9	19,8	21,8	23,2	23,3	9,914	+4,10	204.25.26,83	G.
	β Lyræ.....	62.25	3.32,0	38,3	30,6	30,8	38,0	34,0			62.28.32,98	G.
	α Cassiopeiæ R. M.	226.50	3.18,1	26,3	18,8	20,0	21,0	20,6	9,181	+19,40	226.53.39,30	G.
	α Cassiopeiæ.....	40.0	0.21,8	27,1	22,4	20,4	24,7	22,9			40.0.23,12	G.
	Polaris R. M.....	259.40	1.20,0	26,3	19,8	21,0	25,1	23,1	11,931	-38,01	259.40.44,16	G.
	Polaris.....	7.10	3.20,0	23,8	19,8	17,1	20,1	20,4			7.13.19,30	G.
	Juno.....	95.45	0.35,0	42,9	35,0	35,3	39,2	36,8			95.45.37,20	G.
Coincidence at the middle wire and Runs taken Sept. 25, 0 <sup>h</sup> .30 <sup>m</sup> . (Temp. 62°5.)												

(a) At the five wires. The 1st and 2nd micrometer readings have been altered 5 revolutions. The N.L. was not perfectly even, but in other respects good. Correction applied for defect of illumination of N.L. = -0".20. (b) Indistinct. (c) Through a fog: a mere guess. (d) Both limbs without dark glass, through mist and cloud. N.L. very faint. (e) Misty. The micrometer reading for opposite limb was omitted; the adopted semi-diameter is that of the Nautical Almanac corrected by +0".86. (f) At the 4th wire. (g) At the 5th wire; hurried. (h) The tabular semi-diameter corrected by +0".91 is used, the cusp being too sharp for observation. (i) Cloudy. (k) Small correction for runs on the negative side.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N.P.D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
59,47	54.32.59,72	29,608	53,8	50,8	1.20,76	48.54,50		16.25,65	91.16.8,61	♃.
	54.32.59,65								91.16.8,54	♃.
	53.59.42,53								91.16.1,57	♃.
	53.59.42,70				1.19,14	48.33,83			91.16.1,74	♃.
	53.59.40,84								91.15.59,88	♃.
	46.13.5,35			48,1	1.0,40			15.58,30	84.1.14,03	♄ Piscium.
	-11.25.48,79				11,72				26.21.7,77	*R.23 <sup>h</sup> .54 <sup>m</sup> .16 <sup>s</sup> .
	23.59.58,01				25,80				61.47.32,09	♌ Androm. R.
	23.59.55,30								61.47.29,38	♌ Andromedæ.
	37.54.26,45				45,10				75.42.19,83	♊ Pegasi R.
58,22	37.54.21,25				57,68				75.42.14,63	♊ Pegasi.
	44.53.43,58								82.41.49,54	♄ Piscium.
61,32	51.49.50,03	29,710	53,8	53,5	1.13,03	6,70		15.58,30	89.54.2,94	♃.
	52.21.44,05				1.14,44	6,75			89.54.1,72	♃.
	66.57.42,26	29,718	54,8	55,8	2.13,77	26,02		28,16	104.47.6,45	Venus.
	-39.19.5,31				46,87				-1.32.43,90	Polaris SP. R.
	-39.19.4,32								-1.32.42,91	Polaris SP.
61,25	59.18.53,75	29,780	51,2	48,4	1.37,85	0,38			97.7.39,50	♅ Uranus.
	44.53.44,15	29,794	50,3	47,8	58,07				82.41.50,50	♄ Piscium.
	-57.5.15,19				1.29,90				-19.19.36,81	♏ Draco. SP. R.
61,90	-57.5.14,34								-19.19.35,96	♏ Draconis SP.
	-3.26.38,09				3,51				34.20.26,68	♌ Cassiopeiæ R.
	-3.26.35,93								34.20.28,84	♌ Cassiopeiæ.
61,72	46.36.8,35				1.1,63	43.53,01		16.32,37	83.56.57,62	♃.
	45.10.8,06			46,8	58,75				82.58.15,09	♄ Piscium.
	-36.13.43,23				42,82				1.32.42,23	Polaris R.
	-36.13.41,44				45,13				1.32.44,02	Polaris.
	37.40.51,36								75.28.44,77	♄ Piscium.
60,99	52.45.6,78	29,808	57,4	59,1	1.14,89	6,78		15.58,60	90.17.24,57	♃.
	52.13.12,78				1.13,47	6,74			90.17.26,39	♃.
	-39.19.5,69	29,790	59,3	60,3	46,56				-1.32.43,97	Polaris SP. R.
	-39.19.5,35								-1.32.43,63	Polaris SP.
60,55	66.47.2,81	29,690	60,7	63,2	2.10,55	26,58		28,81	104.36.23,87	Venus.
	-39.19.4,97				46,13				-1.32.42,82	Polaris SP. R.
	-39.19.5,49								-1.32.43,34	Polaris SP.
59,39	19.1.34,17	29,728	59,8	58,5	19,65				56.49.2,10	♈ Lyræ R.
60,58	19.1.31,30								56.48.59,23	♈ Lyræ.
	-36.36.16,44	29,730	55,7	54,8	42,61				1.10.9,23	♌ Ursæ Min. R.
	-36.36.16,92								1.10.8,75	♌ Ursæ Minoris.
60,60	45.43.15,18	29,750	59,0	59,5	58,28	5,29		15.59,10	83.31.16,45	♄ Mercury.
	53.31.55,50	29,752	60,1	61,0	1.16,59	6,86			91.4.14,41	♃.
	52.59.59,53				1.15,13	6,81			91.4.15,23	♃.
60,22	-34.22.7,88	29,760	59,7	58,0	39,03				3.24.21,37	♌ Ursæ Min. R.
	-34.22.9,28								3.24.19,97	♌ Ursæ Minoris.
59,90	13.34.11,22				13,78				51.21.33,28	♌ Lyræ R.
	13.34.9,05								51.21.31,11	♌ Lyræ.
61,21	19.1.34,47				19,69				56.49.2,44	♈ Lyræ R.
	19.1.31,68								56.48.59,65	♈ Lyræ.
61,73	-3.26.38,00	29,782	52,8	51,3	3,49				34.20.26,79	♌ Cassiopeiæ R.
	-3.26.38,18								34.20.26,61	♌ Cassiopeiæ.
	-36.13.42,86			50,3	42,50				1.32.42,92	Polaris R.
	-36.13.42,00								1.32.43,78	Polaris.
	52.18.35,90			49,2	1.15,14	6,03			90.6.53,29	Juno.

Coincidence of Micrometer Wire with fixed Wire = 10', 107, 10', 113, 10', 115, 10', 117, 10', 122 at the five wires.

From Sept. 23 = 10', 110 at the middle wire.

One Micrometer Revolution = 20", 873.

Correction for Runs = -6", 4. From Sept. 24 = -8", 2.

Adopted Zenith Point = 43°. 27'. 0", 82. From Sept. 26 = 43°. 27'. 1", 30.

Assumed Co-latitude = 37°. 47'. 8", 28.



Month and Day.	NAME OF STAR or PLANET.	Pointer. ° ' "	Microscopes.						Micrometer, or Time by Molyneux. r. h. m. s.	Correction for Microm. or Time. ' "	Concluded reading of Circle. ° ' "	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
Sept. 26	Mercury, center...	89.45	1.22,2	27,3	24,3	22,8	27,2	22,2			89.46.23,95	G.
Sept. 27	(a) ☉ N.L. M. ....	96.50	1.12,7	18,5	14,9	14,2	17,4	12,5	12,548	-50,90	96.50.23,80	G.
	☉ S.L. ....	97.20	2.18,6	23,8	20,8	20,0	24,0	19,0			97.22.20,38	G.
	d Piscium.....	88.20	0.45,1	48,3	46,0	45,8	49,2	44,9			88.20.46,33	G.
	α Cassiopeiæ R. M.	226.50	3.15,2	19,5	14,9	13,9	16,3	15,0	8,942	+24,38	226.53.39,28	G.
	α Cassiopeiæ.....	40.0	0.24,2	26,8	22,8	21,0	23,3	21,5			40.0.23,17	G.
	Juno.....	95.55	4.12,1	14,8	11,7	9,8	12,8	10,9			95.59.10,87	G.
Sept. 28	σ Aquarii.....	107.5	2.36,1	39,3	35,9	35,5	38,8	36,0			107.7.36,53	G.
	λ Pegasi.....	72.55	0.42,3	44,3	43,1	40,7	43,8	42,0			72.55.42,58	G.
	μ Pegasi.....	71.50	3.46,1	46,2	47,0	42,9	48,2	45,2			71.53.45,35	G.
	ι Cephei.....	30.15	3.29,2	29,4	25,8	23,8	25,8	27,8			30.18.26,43	G.
	α U. Maj. SP. R. M.	288.30	4.10,2	13,4	10,3	10,0	12,2	11,9	7,015	+1.4,63	288.35.15,31	G.
	α Ursæ Majoris SP.	338.15	3.48,2	50,4	47,2	45,2	47,4	47,3			338.18.47,02	G.
	Uranus.....	102.50	0.6,1	10,2	7,2	6,8	7,9	5,3			102.50.7,23	G.
	γ Cephei R. M....	247.55	2.26,9	30,0	26,4	26,3	29,9	28,1	8,150	+40,93	247.58.8,48	G.
	γ Cephei.....	18.55	0.56,5	57,9	56,3	54,5	56,6	55,9			18.55.56,13	G.
	γ U. Maj. SP. R. M.	296.35	1.25,1	27,0	23,1	24,3	24,9	25,5	11,778	-34,79	296.35.49,98	G.
	γ Ursæ Majoris SP.	330.15	3.12,2	13,0	10,8	9,2	11,8	12,3			330.18.11,05	G.
	ω Piscium.....	89.40	0.6,9	8,1	8,0	5,9	8,8	6,0			89.40.7,27	G.
	(b) α Androm. R. M....	199.25	1.18,4	22,9	18,5	18,7	22,8	20,4	7,984	+44,41	199.27.4,49	G.
	α Andromedæ.....	67.25	1.56,1	56,9	56,0	53,2	57,7	55,1			67.26.55,53	G.
	γ Pegasi R. M....	185.30	1.26,3	29,8	25,1	26,2	27,6	27,3	6,794	+1.9,24	185.32.36,07	G.
	γ Pegasi.....	81.20	1.23,3	24,1	23,2	21,0	23,0	23,5			81.21.22,80	G.
	d Piscium.....	88.20	0.44,8	46,5	45,0	43,5	46,5	44,3			88.20.44,98	G.
	Juno.....	96.10	2.47,8	49,9	47,8	45,8	47,2	46,9			96.12.47,13	G.
Sept. 29	(c) ) N.L. ....	68.0	2.2,8	5,1	5,2	1,2	6,5	3,0		+2,76	68.2.6,41	G.
	) N.L. M. ....	68.0	2.2,8	5,1	5,2	1,2	6,5	3,0	10,023	+1,84	68.2.6,87	G.
	) N.L. M. ....	68.0	2.2,8	5,1	5,2	1,2	6,5	3,0	9,968	+1,38	68.2.6,63	G.
	) N.L. M. ....	68.0	2.2,8	5,1	5,2	1,2	6,5	3,0	9,912	+2,98	68.2.6,52	G.
	) N.L. M. ....	68.0	2.2,8	5,1	5,2	1,2	6,5	3,0	9,950	+4,25	68.2.6,52	G.
	) N.L. M. ....	68.0	2.2,8	5,1	5,2	1,2	6,5	3,0	9,950	-1,38	68.2.4,46	G.
	ι Geminorum.....	67.30	2.42,2	44,0	44,3	39,4	48,0	41,9			67.32.42,88	G.
	Castor R. M. ....	203.25	2.39,0	44,0	37,8	39,8	43,0	39,7	7,482	+54,88	203.28.35,03	G.
	Castor.....	63.25	0.25,2	28,2	27,0	23,2	28,5	25,7			63.25.26,23	G.
	Procyon R. M....	176.50	1.24,1	29,9	26,8	25,7	30,6	26,0	4,868	+1.49,43	176.53.16,38	G.
	Procyon.....	90.0	0.42,7	46,3	44,9	43,2	47,2	43,5			90.0.44,52	G.
	Pollux R. M. ....	199.40	0.34,7	39,0	35,1	36,8	37,7	36,4	14,382	-1.29,14	199.39.7,38	G.
	(d) Pollux.....	67.10	4.51,9	54,8	55,2	51,3	55,2	52,0			67.14.53,42	G.
	Regulus R. M....	184.0	0.31,1	37,1	32,3	32,9	37,3	33,3	11,872	-36,75	183.59.57,17	G.
	Regulus.....	82.50	4.3,8	6,9	6,7	2,8	10,1	3,4			82.54.4,98	G.
	α Ursæ Maj. R. M.	233.50	1.21,1	24,0	21,0	20,0	22,8	21,3	11,619	-31,48	233.50.50,02	G.
	α Ursæ Majoris...	33.0	3.14,1	17,4	14,8	10,8	18,3	13,2			33.3.14,27	G.
	(e) Mercury, center...	91.45	0.19,0	25,1	20,4	22,1	23,8	19,5			91.45.21,60	G.
Sept. 30	(f) Venus N.L. ....	109.20	1.43,3	50,1	46,0	47,0	48,2	44,0			109.21.46,15	G.
	Polaris SP. R. M..	262.45	2.19,8	20,8	19,5	17,0	19,8	19,7	13,639	-1.13,65	262.46.5,42	G.
	Polaris SP. ....	4.5	2.58,0	62,2	62,0	57,4	65,8	58,4			4.8.0,17	G.
	λ Pegasi.....	72.55	0.42,2	43,8	44,3	40,4	44,8	41,8			72.55.42,77	G.
	μ Pegasi.....	71.50	3.46,4	47,2	47,6	42,8	49,0	45,0			71.53.45,75	G.
	α U. Maj. SP. R. M.	288.30	4.16,8	18,0	16,4	15,8	18,3	18,7	7,340	+57,84	288.35.14,51	G.
	α Ursæ Major. SP.	338.15	3.48,9	49,5	48,3	45,8	50,3	49,4			338.18.48,10	G.
	Uranus.....	102.50	1.43,7	46,2	43,0	42,3	45,1	43,4			102.51.43,68	G.
	α Cassiopeiæ R. M.	226.50	2.23,0	25,1	22,9	22,2	25,8	23,7	6,368	+1.18,12	226.53.41,54	G.
	α Cassiopeiæ.....	40.0	0.23,0	25,0	22,9	20,1	24,0	22,7			40.0.22,88	G.
	Polaris R. M. ....	259.40	1.19,0	23,1	19,5	19,0	21,2	22,1	11,764	-34,49	259.40.45,96	G.
	Polaris.....	7.10	3.18,7	19,3	18,2	15,1	20,9	18,5			7.13.17,93	G.

Coincidence at the five wires and Runs taken Sept. 30, 1<sup>h</sup>.15<sup>m</sup>. (Temp. 57°.)

(a) Cloudy.

(b) Blur.

(d) Small correction for runs.

(c) At the five wires; limb not perfectly full, and the observation consequently doubtful. Correction applied for defect of illumination = -1",48.

(e) A faint blur.

(f) Extraordinary motion. Tabular semidiameter corrected by +0",98 used.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
61,23	46. 19. 22,65	29,800	57,7	58,2	59,77	5,24			84. 7. 25,46	Mercury.
	53. 23. 22,50	29,798	58,4	58,4	1. 16,71	6,85		15. 59,40	91. 27. 40,04	☉.
	53. 55. 19,08				1. 18,21	6,89			91. 27. 39,28	☉.
	44. 53. 45,03	29,570	55,0	53,9	56,93				82. 41. 50,24	d Piscium.
	- 3. 26. 37,98				3,44				34. 20. 26,86	α Cassiopeiæ R.
	- 3. 26. 38,13								34. 20. 26,71	α Cassiopeiæ.
61,17	52. 32. 9,57	29,550	54,5	53,0	1. 14,58	6,08			90. 20. 26,35	Juno.
	63. 40. 35,23	29,460	55,6	53,0	1. 54,83				101. 29. 38,34	σ Aquarii.
	29. 28. 41,28			50,2	32,45				67. 16. 22,01	λ Pegasi.
	28. 26. 44,05				31,10				66. 14. 23,43	μ Pegasi.
	- 13. 8. 34,87				13,41				24. 38. 20,00	ι Cephei.
	- 65. 8. 14,01				2. 3,23				- 27. 23. 8,96	α U. Maj. SP. R.
62,31	- 65. 8. 14,28				1. 36,71	0,38			- 27. 23. 9,23	α Ursæ Maj. SP.
	59. 23. 5,93				26,23				97. 11. 50,54	Uranus.
	- 24. 31. 7,18			49,5	3. 7,43				13. 15. 34,87	γ Cephei R.
	- 24. 31. 5,17				59,92				13. 15. 36,88	γ Cephei.
	- 73. 8. 48,68				25,59				- 35. 24. 47,83	γ U. Maj. SP. R.
	- 73. 8. 50,25				44,75				- 35. 24. 49,40	γ Ursæ Maj. SP.
60,52	46. 13. 5,97				57,23				84. 1. 14,17	ω Piscium.
	23. 59. 56,81				1. 15,81	6,12			61. 47. 30,68	α Androm. R.
	23. 59. 54,23								61. 47. 28,10	α Andromedæ.
	37. 54. 25,23								75. 42. 18,26	γ Pegasi R.
	37. 54. 21,50								75. 42. 14,53	γ Pegasi.
	44. 53. 43,68								82. 41. 40,19	d Piscium.
60,01	52. 45. 45,83	29,454	50,0	47,4					90. 34. 3,80	Juno.
	24. 35. 5,11	29,748	51,0	46,1					62. 14. 31,60	)).
	24. 35. 5,57								62. 14. 32,06	)).
	24. 35. 5,33				26,74	23. 56,41		15. 49,36	62. 14. 31,82	)).
	24. 35. 5,22								62. 14. 31,71	)).
	24. 35. 3,16								62. 14. 29,65	)).
60,63	24. 5. 41,58			44,4	26,23				61. 53. 16,09	ι Geminorum.
	19. 58. 26,27				21,33				57. 45. 55,88	Castor R.
	19. 58. 24,93				1. 1,88				57. 45. 54,54	Castor.
	46. 33. 44,92				25,87				84. 21. 55,08	Procyon R.
	46. 33. 43,22								84. 21. 53,38	Procyon.
	23. 47. 53,92								61. 35. 28,07	Pollux R.
60,40	23. 47. 52,12				47,57				61. 35. 26,27	Pollux.
	39. 27. 4,13	29,790	51,0	52,0	10,58				77. 14. 59,98	Regulus R.
	39. 27. 3,68								77. 14. 59,53	Regulus.
	- 10. 23. 48,72	29,812	52,6	54,2	1. 4,34	5,14			27. 23. 8,98	α Ursæ Maj. R.
	- 10. 23. 47,03								27. 23. 10,67	α Ursæ Majoris.
	48. 18. 20,30		53,8	56,2					86. 6. 27,78	Mercury.
62,80	65. 54. 44,85	29,816	54,5	57,6	2. 7,27	27,56		30,08	103. 44. 2,92	Venus.
	- 39. 19. 4,12				46,85				1. 32. 42,69	Polaris SP. R.
	- 39. 19. 1,13				32,92				1. 32. 39,70	Polaris SP.
	29. 28. 41,47	29,900	51,8	50,4	31,55				67. 16. 22,67	λ Pegasi.
	28. 26. 44,45				2. 5,01				66. 14. 24,28	μ Pegasi.
	- 65. 8. 13,21				1. 38,21	0,38			- 27. 23. 9,94	α U. Maj. SP. R.
61,31	- 65. 8. 13,20				3,51				- 27. 23. 9,93	α Ursæ Maj. SP.
	59. 24. 42,38				42,82				97. 13. 28,49	Uranus.
	- 3. 26. 40,24			49,4					34. 20. 24,53	α Cassiopeiæ R.
	- 3. 26. 38,42								34. 20. 26,35	α Cassiopeiæ.
	- 36. 13. 44,66			48,5					1. 32. 40,80	Polaris R.
	- 36. 13. 43,37								1. 32. 42,09	Polaris.

Coincidence of Micrometer Wire with fixed Wire = 10",110, at the middle wire. From Sept. 28 = 10",106, 10",111, 10",111, 10",116, 10",121 at the five wires.

One Micrometer Revolution = 20",873.

Correction for Runs = - 8",2. From Sept. 28 = - 4",7.

Adopted Zenith Point = 43°. 27'. 1",30.

Assumed Co-latitude = 37°. 47'. 8",28.



Month and Day.	NAME OF STAR or PLANET.	Pointer. ° ' "	Microscopes.						Micrometer, or Time by Molyneux. h. m. s.	Correction for Microm. or Time. ' "	Concluded reading of Circle. ° ' "	Observer.
			A	B	C	D	E	F				
			' "	" "	" "	" "	" "	" "				
Sept. 30	Juno .....	96.40	0.14,2	17,3	15,9	14,4	16,6	15,1			96.40.15,55	G.
	(a) » S.L. ....	71.10	0.7,8	11,1	10,7	6,9	11,3	8,9			71.10.14,49	G.
	» S.L. M. ....	71.10	0.7,8	11,1	10,7	6,9	11,3	8,9	9,890	+5,06	71.10.16,57	G.
	» S.L. M. ....	71.10	0.7,8	11,1	10,7	6,9	11,3	8,9	9,800	+4,61	71.10.15,92	G.
	» S.L. M. ....	71.10	0.7,8	11,1	10,7	6,9	11,3	8,9	9,680	+2,53	71.10.16,01	G.
	» S.L. M. ....	71.10	0.7,8	11,1	10,7	6,9	11,3	8,9	9,530	+6,49	71.10.16,71	G.
	» S.L. M. ....	71.10	0.7,8	11,1	10,7	6,9	11,3	8,9	9,530	+9,11	71.10.16,71	G.
	» S.L. M. ....	71.10	0.7,8	11,1	10,7	6,9	11,3	8,9	9,530	-2,53	71.10.16,71	G.
Oct. 1	α Ursæ Maj. R. M.	233.50	1.27,7	30,3	27,5	25,8	30,5	28,8	12,000	+12,34	233.50.48,79	G.
	α Ursæ Majoris...	33.0	3.13,1	17,0	13,0	11,5	18,7	13,0		-39,43	33.3.13,88	G.
	(b) ☉ N.L. M. ....	98.20	4.20,3	25,2	21,8	19,9	27,0	20,8	11,572	-30,49	98.23.51,34	G.
	☉ S.L. ....	98.55	0.49,8	56,0	52,7	52,6	52,4	49,3			98.55.52,00	G.
	(c) α Cephei R. M....	233.5	2.15,5	17,2	13,5	14,2	19,8	16,7	5,990	+1.26,23	233.8.40,90	G.
	α Cephei .....	33.45	0.16,0	18,5	14,5	14,4	18,0	15,9		-1,13	33.45.18,70	G.
	Uranus. ....	102.50	2.31,0	33,9	30,1	29,8	35,9	30,3		+2,53	102.52.31,43	G.
	(d) ☉ S.L. M. ....	99.15	4.19,0	25,8	19,8	18,8	24,5	19,4	10,538	-8,92	99.19.11,63	G.
Oct. 2	☉ N.L. ....	98.45	2.9,9	15,7	10,8	10,0	15,0	9,1			98.47.11,42	G.
	Juno .....	97.5	2.55,7	58,0	57,8	55,8	56,3	55,8			97.7.56,03	G.
	α Ursæ Maj. R. M.	233.50	1.20,5	23,0	20,0	20,9	23,3	22,2	11,762	-34,45	233.50.47,00	G.
	(e) α Ursæ Majoris...	33.0	3.13,8	17,2	15,0	10,9	17,8	14,7		+0,29	33.3.14,69	G.
	Mercury, center..	93.55	0.4,8	9,9	9,9	8,3	10,1	5,7			93.55.8,10	G.
	(f) ☉ N.L. M. ....	99.10	0.16,3	22,2	18,3	18,0	22,5	15,8	9,789	+6,72	99.10.25,52	G.
	☉ S.L. ....	99.40	2.24,8	30,2	27,1	25,3	30,7	25,0			99.42.26,82	G.
	Venus N.L. ....	108.30	4.9,8	14,8	11,8	9,5	16,5	9,1			108.34.11,27	G.
Oct. 3	Polaris SP. R. M.	262.45	2.22,2	26,0	22,8	20,8	27,4	22,7	13,842	-1.17,88	262.46.5,40	G.
	Polaris SP. ....	4.5	2.59,9	64,3	63,2	58,8	66,7	60,7			4.8.1,80	G.
	Arcturus R. M....	191.10	4.14,6	18,9	15,5	14,9	20,5	16,5	5,140	+1.43,76	191.15.59,91	G.
	Arcturus. ....	75.35	2.60,0	64,0	62,3	59,0	65,2	59,8			75.38.1,25	G.
	(g) Polaris SP. R. M.	262.45	2.9,7	13,6	11,8	10,1	15,1	11,2	13,289	-1.6,34	262.46.5,23	G.
	Polaris SP. ....	4.5	2.57,2	62,0	59,8	56,8	65,3	58,6			4.7.59,48	G.
	(b) ☉ N.L. M. ....	100.40	3.31,7	36,8	33,5	32,0	36,4	33,2	11,714	-33,45	100.42.59,93	G.
	☉ S.L. ....	101.10	5.1,1	7,0	5,0	1,5	9,4	2,8			101.15.3,67	G.
Oct. 7	α Pegasi R. M....	185.30	4.27,0	33,8	27,4	26,9	29,8	30,2	6,544	+1.14,46	185.35.42,94	G.
	α Pegasi .....	81.15	3.14,9	21,9	17,9	14,5	18,2	17,0			81.18.16,88	G.
	Uranus .....	102.55	2.2,7	7,7	4,7	4,7	7,3	3,2			102.57.4,72	G.
	δ App. Sculp. ....	124.30	4.39,0	45,1	39,0	39,1	43,8	39,7			124.34.40,22	G.
	ω Piscium .....	89.40	0.4,0	8,6	7,0	4,2	7,3	5,9			89.40.6,15	G.
	α Androm. R. M....	199.25	1.22,3	28,0	22,8	22,2	27,2	25,0	8,028	+43,48	199.27.7,85	G.
	α Andromedæ....	67.25	1.53,3	56,8	55,4	51,0	56,5	53,8			67.26.54,17	G.
	γ Pegasi R. M....	185.30	1.17,8	22,0	18,5	19,6	21,3	20,6	6,319	+1.19,15	185.32.38,92	G.
	γ Pegasi .....	81.20	1.20,9	23,8	23,1	19,9	25,0	22,8			81.21.22,37	G.
	α Cassiopeiæ R. M.	226.50	2.20,2	25,6	20,4	20,4	23,3	21,2	6,179	+1.22,08	226.53.43,56	G.
	α Cassiopeiæ .....	40.0	0.20,8	23,1	20,5	18,8	21,0	20,0			40.0.20,65	G.
	Polaris R. M....	259.40	1.19,8	24,0	19,9	20,1	25,1	22,8	11,707	-33,32	259.40.48,41	G.
	Polaris .....	7.10	3.16,9	17,3	17,2	12,6	19,0	16,9			7.13.16,13	G.
	(h) ☉ N.L. M. ....	101.25	4.19,8	26,1	21,1	19,8	26,8	20,6	11,252	-23,89	101.28.57,16	G.
	☉ S.L. ....	102.0	0.56,0	64,1	59,9	58,9	61,2	57,5			102.0.59,30	G.
	☉ S.L. M. ....	102.20	4.6,1	12,9	7,1	6,5	8,6	6,6	10,933	-17,25	102.23.49,47	G.
	☉ N.L. ....	101.50	1.45,9	50,4	46,1	46,5	51,9	45,9			101.51.47,23	G.
Oct. 10	Polaris R. M....	259.40	1.27,1	30,8	26,0	26,5	29,0	29,9	11,934	-38,14	259.40.49,64	G.
	Polaris .....	7.10	3.11,4	14,0	11,9	7,9	12,9	11,0			7.13.10,55	G.
	Venus N.L. ....	105.45	1.45,0	49,0	47,5	45,0	49,2	42,7			105.46.45,85	G.

Coincidence at the middle wire and Runs taken Oct. 9, 1<sup>h</sup>. (Temp. 63°.)

- (a) At the five wires; ragged, but full.  
 (b) Very cloudy. (c) At the 5th wire and comb.  
 (d) Much obscured by misty clouds.  
 (e) At the 4th wire.  
 (f) The cusps have now the same declination, but are

- too sharp for observation. The tabular semi-diameter with a correction + 0",90 is used.  
 (g) Badly defined and dancing.  
 (h) Cloudy. A great change of temperature since the last observation.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
61,34	53.13.14,25	29,910	51,0	48,6	1.18,10	6,21			91.1.34,42	Juno.
	27.43.13,19		47,6	44,0					64.48.48,42	♃.
	27.43.15,27								64.48.50,50	♃.
	27.43.14,62				31,01	26.26,93		15.37,13	64.48.49,85	♃.
	27.43.14,71								64.48.49,94	♃.
	27.43.15,41								64.48.50,64	♃.
61,34	-10.23.47,49	29,930	51,5	52,3	10,66				27.23.10,13	α Ursæ Maj. R.
	-10.23.47,42								27.23.10,20	α Ursæ Majoris.
59,80	54.56.50,04	29,908	53,4	55,5	1.22,00	6,99		16.0,50	93.1.13,83	☉.
	55.28.50,70				1.23,63	7,04			93.1.15,07	☉.
	-9.41.39,60	29,820	53,8	52,6	9,88				28.5.18,80	α Cephei R.
	-9.41.42,60								28.5.15,80	α Cephei.
	59.25.30,13	29,780	51,6	49,8	1.37,99	0,38			97.14.16,02	Uranus.
60,85	55.52.10,33	29,588	54,6	56,2	1.23,83	7,07		16.0,70	93.24.34,67	☉.
	55.20.10,12				1.22,18	7,03			93.24.34,25	☉.
	53.40.54,73	29,762	50,4	47,9	1.19,12	6,29			91.29.15,84	Juno.
	-10.23.45,70	29,904	52,3	52,1	10,65				27.23.11,93	α Ursæ Maj. R.
	-10.23.46,61								27.23.11,02	α Ursæ Majoris.
	50.28.6,80	29,900	53,6	54,8	1.9,83	5,09			88.16.19,82	Mercury.
63,60	55.43.24,22	29,900	54,0	55,2	1.24,42	7,06		16.1,00	93.47.50,86	☉.
	56.15.25,52				1.26,13	7,11			93.47.51,82	☉.
	65.7.9,97				2.3,70	27,81		30,54	102.56.24,68	Venus.
	-39.19.4,10	29,894	54,5	56,4	47,09				-1.32.42,91	Polaris SP. R.
	-39.18.59,50								-1.32.38,31	Polaris SP.
60,58	32.11.1,39	29,882	55,1	56,1	36,20				69.58.45,87	Arcturus R.
	32.10.59,95								69.58.44,43	Arcturus.
62,36	-39.19.3,93	29,400	57,4	58,6	46,10				-1.32.41,75	Polaris SP. R.
	-39.19.1,82								-1.32.39,64	Polaris SP.
59,91	57.15.58,63	30,236	51,6	52,2	1.31,04	7,20		16.2,10	95.20.32,85	☉.
	57.48.2,37				1.32,92	7,24			95.20.34,23	☉.
	37.51.18,36	30,138	50,1	47,1	45,91				75.39.12,55	α Pegasi R.
	37.51.15,58								75.39.9,77	α Pegasi.
	59.30.3,42				1.40,02	0,38			97.18.51,34	Uranus.
61,01	81.7.38,92	30,130	48,7	46,0	6.3,18				119.0.50,38	♄ App. Sculp.
	46.13.4,85				1.1,72				84.1.14,85	♊ Piscium.
	23.59.53,45				26,36				61.47.28,09	α Androm. R.
	23.59.52,87								61.47.27,51	α Andromedæ.
60,65	37.54.22,38				46,09				75.42.16,75	γ Pegasi R.
	37.54.21,07								75.42.15,44	γ Pegasi.
62,11	-3.26.42,26				3,57				34.20.22,45	α Cassiopeiæ R.
	-3.26.40,65								34.20.24,06	α Cassiopeiæ.
62,27	-36.13.47,11	30,112	48,0	45,5	43,39				1.32.37,78	Polaris R.
	-36.13.45,17								1.32.39,72	Polaris.
60,10	58.1.55,86	29,780	60,3	61,8	1.30,56	7,26		16.2,70	96.6.30,14	☉.
	58.33.58,00				1.32,46	7,31			96.6.28,73	☉.
	58.56.48,17	29,564	59,5	61,5	1.33,23	7,34		16.2,90	96.29.19,44	☉.
	58.24.45,93				1.31,30	7,30			96.29.21,11	☉.
	-36.13.48,34	29,610	56,4	55,3	41,82				1.32.38,12	Polaris R.
	-36.13.50,75								1.32.35,71	Polaris.
	62.19.44,55	29,538	59,0	62,6	1.46,61	27,04	7,210	31,22	100.8.43,62	Venus.

Coincidence of Micrometer Wire with fixed Wire = 10', 106, 10', 111, 10', 111, 10', 116, 10', 121 at the five wires.

From Oct. 9 = 10', 107 at the middle wire.

One Micrometer Revolution = 20'', 873.

Correction for Runs = -4'', 7. From Oct. 9 = -9'', 2.

Adopted Zenith Point = 43°. 27'. 1'', 30.

Assumed Co-latitude = 37°. 47'. 8'', 28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.	Microscopes.						Micrometer, or Time by Molyneux.	Correction for Microm. or Time.	Concluded reading of Circle.	Observer.
			A	B	C	D	E	F				
			° ' "	° ' "	° ' "	° ' "	° ' "	° ' "				
Oct. 10	Mercury, center...	99.55	4. 4,8	10,3	7,9	5,0	11,9	4,0	13,870	- 1. 18,54	99.59. 6,07	G.
	Polaris SP. R. M...	262.45	2. 18,5	22,2	18,9	18,5	19,9	20,1			262.46. 0,43	G.
	Polaris SP.....	4. 5	3. 1,8	4,9	4,4	0,0	8,9	2,8			4. 8. 2,87	G.
Oct. 11	(a) ☉ N.L. M.....	102.10	4. 13,8	22,9	16,9	14,2	22,9	15,1	9,318	+ 16,47	102.14. 32,79	G.
	☉ S.L. ....	102.45	1. 35,1	43,2	36,8	35,9	41,3	33,6			102.46. 37,15	G.
	Arcturus R. M...	191.15	2. 16,6	21,8	16,2	18,5	20,6	20,0			191.15. 56,67	G.
	Arcturus .....	75.35	3. 0,5	7,5	4,3	0,2	9,2	1,0	14,014	- 1. 21,56	75.38. 2,85	G.
	Juno.....	99.10	1. 17,0	24,1	18,5	18,8	20,0	17,8			99.11. 18,97	G.
	α Arietis R. M...	193.55	1. 32,7	38,8	33,3	34,5	36,3	36,1			193.56. 58,24	G.
	α Arietis.....	72.55	2. 0,1	5,8	2,7	0,1	3,0	1,9	8,984	+ 23,44	72.57. 1,65	G.
	Venus N.L.....	105.20	3. 43,3	49,1	45,3	43,9	50,0	43,0			105.23. 44,60	G.
	Polaris SP. R. M...	262.45	2. 22,1	27,1	22,8	22,2	24,9	24,6			262.45. 58,19	G.
	Polaris SP.....	4. 5	3. 1,3	5,0	4,0	0,4	8,5	1,9	14,181	- 1. 25,03	4. 8. 2,58	G.
Oct. 12	(b) ☉ S.L. M.....	103. 5	3. 19,0	24,3	18,2	18,9	23,8	18,8	7,482	+ 54,79	103. 9. 14,27	G.
	☉ N.L.....	102.35	2. 8,7	14,9	11,0	10,2	14,8	8,7			102.37. 10,72	G.
Oct. 13	α Ursæ Maj. R. M.	233.50	1. 31,0	33,0	29,5	29,3	32,8	31,0	12,292	- 45,61	233.50. 45,24	G.
	α Ursæ Majoris ...	33. 0	3. 17,1	20,7	17,9	14,2	20,4	17,2			33. 3. 17,35	G.
	Venus N.L. ....	104.35	2. 53,0	57,2	54,3	52,7	55,1	51,4			104.37. 53,47	G.
Oct. 14	(c) ☉ S.L. ....	103.50	4. 14,1	20,8	16,2	15,1	19,2	14,7			103.54. 15,95	G.
	☉ N.L.....	103.20	2. 9,8	16,0	11,4	10,9	13,2	8,9			103.22. 11,33	G.
	(d) ☽ N.L. M.....	124. 5	4. 27,6	33,9	28,6	27,8	32,4	30,5	9,284	+ 17,04 - 2,10	124. 9. 44,31	G.
	☽ N.L. M.....	124. 5	4. 27,6	33,9	28,6	27,8	32,4	30,5			124. 9. 41,47	G.
	☽ N.L. M.....	124. 5	4. 27,6	33,9	28,6	27,8	32,4	30,5	9,474	+ 13,15 - 1,05	124. 9. 41,73	G.
	☽ N.L. M.....	124. 5	4. 27,6	33,9	28,6	27,8	32,4	30,5			124. 9. 43,00	G.
	☽ N.L. M.....	124. 5	4. 27,6	33,9	28,6	27,8	32,4	30,5	9,515	+ 12,58 + 1,05	124. 9. 43,50	G.
	☽ N.L. M.....	124. 5	4. 27,6	33,9	28,6	27,8	32,4	30,5			124. 9. 43,50	G.
	(e) Uranus.....	103. 0	1. 53,7	58,8	56,1	55,0	56,1	54,1		- 0,09	103. 1. 55,23	G.
	(f) ☽ U. Maj. SP. R. M.	293.15	2. 35,1	36,4	34,1	32,4	32,8	35,9			293.16. 11,78	G.
	☽ Ursæ Majoris SP.	333.35	2. 50,0	51,3	50,3	48,8	53,0	50,8	14,047	- 1. 22,24	333.37. 50,22	G.
	κ Draco. SP. R. M.	280.30	2. 38,0	40,9	38,3	37,9	38,5	40,4			280.32. 24,65	G.
	κ Draconis SP. ...	346.20	1. 38,0	38,9	37,7	35,4	38,6	38,5	10,773	- 13,90	346.21. 37,58	G.
	Polaris R. M.....	259.40	1. 31,2	34,8	30,9	31,8	31,9	33,8			259.40. 51,62	G.
	Polaris.....	7. 10	3. 14,2	13,5	15,3	10,4	13,3	14,5	12,049	- 40,53	7. 13. 12,98	G.
	Juno.....	99.50	0. 36,8	38,0	37,9	35,1	37,2	36,2			99.50. 36,77	G.
Oct. 15	☽ Draconis R. M...	238.35	1. 29,2	32,0	29,7	29,2	31,4	32,8	8,956	+ 24,02	238.36. 54,49	G.
	☽ Draconis.....	28.15	2. 11,1	11,0	11,6	7,9	12,2	10,4			28.17. 10,33	G.
	(g) ☽ S.L. M.....	122.35	2. 51,0	54,7	52,8	50,7	55,0	51,2	11,001	- 18,81 - 4,34	122.37. 28,93	G.
	☽ S.L. M.....	122.35	2. 51,0	54,7	52,8	50,7	55,0	51,2			122.37. 30,99	G.
	☽ S.L. M.....	122.35	2. 51,0	54,7	52,8	50,7	55,0	51,2	11,010	- 18,92 - 2,17	122.37. 29,33	G.
	☽ S.L. M.....	122.35	2. 51,0	54,7	52,8	50,7	55,0	51,2			122.37. 29,33	G.
	☽ S.L. M.....	122.35	2. 51,0	54,7	52,8	50,7	55,0	51,2	11,197	- 22,75 - 25,01	122.37. 29,24	G.
	☽ S.L. M.....	122.35	2. 51,0	54,7	52,8	50,7	55,0	51,2			122.37. 29,24	G.
	☽ S.L. M.....	122.35	2. 51,0	54,7	52,8	50,7	55,0	51,2	11,310	+ 2,17 - 27,68	122.37. 28,74	G.
	☽ S.L. M.....	122.35	2. 51,0	54,7	52,8	50,7	55,0	51,2			122.37. 28,74	G.
	(h) α Aquilæ R. M...	179.40	2. 21,0	25,1	22,8	21,8	22,7	24,0	10,818	- 14,84	179.42. 7,66	G.
	α Aquilæ.....	87.10	1. 51,8	54,0	55,1	51,5	53,4	53,1			87.11. 52,83	G.
	β Aquilæ R. M...	177.15	1. 32,4	37,2	34,8	34,0	36,9	35,6	12,087	- 41,33	177.15. 53,55	G.
	β Aquilæ .....	89.35	3. 7,8	9,0	9,4	5,4	10,5	9,0			89.38. 7,98	G.
	c Sagittarii.....	123.40	3. 27,8	31,0	28,8	26,1	30,7	29,7			123.43. 28,43	G.
	σ Capricorni.....	115.10	3. 48,8	52,2	50,3	48,3	50,2	50,0			115.13. 49,32	G.
	π Capricorni.....	114.20	1. 1,9	5,0	5,0	2,7	2,6	3,1			114.21. 3,20	G.
	λ Ursæ Min. R. M.	260. 5	0. 20,9	22,7	20,6	21,8	22,0	24,9			260. 3. 20,74	G.
	λ Ursæ Minoris...	6.50	0. 44,0	44,0	45,0	41,2	44,8	45,2	15,920	- 2. 1,34	6.50. 43,92	G.

Runs taken Oct. 16, 1<sup>h</sup>. (Temp. 56°.)

- (a) Cloudy. (b) Misty clouds.  
(c) Came on the fixed wire: bisection not perfect, but could not be improved by the micrometer wire.  
(d) At the five wires. Very uncertain; extremely cloudy and faint.

- (e) At the 5th wire. Correction for change of N.P.D. = - 0",02.  
(f) Too much wind.  
(g) At the five wires: extraordinary motion and no definition.  
(h) Blur.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
61,65	56.32.47,77	29,528	59,8	64,0	1.24,44	5,13			94.20.32,36	Mercury.
	-39.18.59,13				45,81				-1.32.36,66	Polaris SP. R.
	-39.18.58,43								-1.32.35,96	Polaris SP.
59,76	58.47.31,49	29,524	60,0	63,5	1.32,17	7,33		16.3,20	96.52.7,81	☉.
	59.19.35,85				1.34,13	7,37			96.52.7,69	☉.
	32.11.4,63	29,520	60,2	64,9	35,14				69.58.48,05	Arcturus R.
	32.11.1,55								69.58.44,97	Arcturus.
59,95	55.44.17,67	29,592	58,8	58,6	1.23,03	6,57			93.32.42,41	Juno.
	29.30.3,06				32,07				67.17.43,41	α Arietis R.
	29.30.0,35								67.17.40,70	α Arietis.
60,39	61.56.43,30	29,816	57,8	57,9	1.46,90	26,81	7,115	32,82	99.45.44,49	Venus.
	-39.18.56,89	29,832	58,0	57,8	46,85				-1.32.35,46	Polaris SP. R.
	-39.18.58,72								-1.32.37,29	Polaris SP.
61,30	59.42.12,97	29,840	58,2	58,2	1.37,59	7,40		16.3,50	97.14.47,94	☉.
	59.10.9,42				1.35,55	7,36			97.14.49,39	☉.
	-10.23.43,94	29,860	54,5	54,2	10,59				27.23.13,75	α Ursæ Maj. R.
	-10.23.43,95								27.23.13,74	α Ursæ Majoris.
	61.10.52,17	29,850	56,8	57,2	1.43,84	26,27	7,171	30,71	98.59.48,73	Venus.
	60.27.14,65	29,842	57,8	58,6	1.40,50	7,46		16.4,10	97.59.51,87	☉.
	59.55.10,03				1.38,37	7,42			97.59.53,36	☉.
	80.42.43,01	29,800	56,3	54,7					117.56.13,60	☾.
	80.42.40,17								117.56.10,76	☾.
	80.42.40,43				5.37,76	54.16,87		15.1,42	117.56.11,02	☾.
	80.42.41,70								117.56.12,29	☾.
	80.42.42,20								117.56.12,79	☾.
61,00	59.34.53,93	29,788	52,9	51,6	1.38,26	0,38			97.23.40,09	Uranus.
	-69.49.10,48	29,780	53,0	51,4	2.36,17				-32.4.38,37	δ Ur. Maj. SP. R.
	-69.49.11,08								-32.4.38,97	δ Ursæ Maj. SP.
61,12	-57.5.23,35				1.29,21				-19.19.44,28	κ Draco. SP. R.
	-57.5.23,72								-19.19.44,65	κ Draconis SP.
62,30	-36.13.50,32			50,4	42,48				1.32.35,48	Polaris R.
	-36.13.48,32								1.32.37,48	Polaris.
	56.23.35,47				1.27,07	6,64			94.12.4,18	Juno.
62,41	-15.9.53,19	29,814	52,8	50,8	15,73				22.36.59,36	δ Draconis R.
	-15.9.50,97								22.37.1,58	δ Draconis.
	79.10.27,63		52,0	49,4					115.52.35,98	☾.
60,25	79.10.29,69								115.52.38,04	☾.
	79.10.28,03				4.55,29	54.42,36		15.12,86	115.52.36,38	☾.
	79.10.27,94								115.52.36,29	☾.
	79.10.27,44								115.52.35,79	☾.
	43.44.53,64				55,66				81.32.57,58	α Aquilæ R.
60,77	43.44.51,53								81.32.55,47	α Aquilæ.
	46.11.7,75				1.0,58				83.59.16,61	β Aquilæ R.
	46.11.6,68				5.27,19				83.59.15,54	β Aquilæ.
62,33	80.16.27,13				2.55,38				118.9.2,60	c Sagittarii.
	71.46.48,02	29,824	51,2	48,3	2.46,88				109.36.51,68	σ Capricorni.
	70.54.1,90				43,32				108.43.57,06	π Capricorni.
	-36.36.19,44								1.10.5,52	λ Ursæ Min. R.
	-36.36.17,38								1.10.7,58	λ Ursæ Minoris.

Coincidence of Micrometer Wire with fixed Wire = 10",107 at the middle wire. For the Moon on Oct. 14, 15 and 16, the adopted coincidences are 10",100, 10",104, 10",107, 10",112, 10",118; which were inferred from those found Oct. 25 by applying the difference of the coincidence at middle wire on that day and on Oct. 9. One Micrometer Revolution = 20",873.  
Correction for Runs = -9",2. From Oct. 13 = -5",1.  
Adopted Zenith Point = 43°.27'.1",30.  
Assumed Co-latitude = 37°.47'.8",28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  r. h. m. s.	Correction for Microm. or Time.  " "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
Oct. 15	λ Pegasi.....	72.55	0.40,7	40,9	43,1	38,0	41,8	40,2	15,983	-2. 2,66	72.55.40,67	G.
	μ Pegasi.....	71.50	3.44,0	44,2	46,8	39,6	47,2	43,9			71.53.43,65	G.
	α U. Maj. SP. R. M.	288.35	2.20,8	22,0	19,8	20,9	18,0	22,8			288.35.17,67	G.
	α Ursæ Majoris SP.	338.15	3.46,3	47,1	46,4	42,3	47,8	47,0			338.18.45,52	G.
	Uranus.....	103. 0	2.30,3	34,5	31,4	29,8	31,0	31,0	10,804	-14,55	103. 2.30,90	G.
	α Androm. R. M.	199.25	2.22,4	25,2	22,4	22,3	22,6	24,9			199.27. 8,35	G.
	α Andromedæ....	67.25	1.53,7	54,0	55,8	50,4	52,8	53,9			67.26.53,12	G.
	Juno.....	100. 0	3.24,2	26,2	26,5	21,8	26,8	25,3			100. 3.24,55	G.
	α Ursæ Maj. R. M.	233.50	1.36,0	39,0	35,9	35,3	38,9	36,2	12,610	-52,25	233.50.44,37	G.
	α Ursæ Majoris...	33. 0	3.18,0	20,9	18,9	15,9	21,5	18,2			33. 3.18,33	G.
	(a) Venus S.L.....	103.50	3.53,5	57,7	55,7	53,3	59,2	53,4			103.53.54,80	G.
	Polaris SP. R. M.	262.45	2.27,0	31,0	26,4	27,2	29,5	29,0	14,473	-1.31,13	262.45.56,80	G.
	Polaris SP.....	4. 5	3. 5,1	7,4	7,7	3,2	11,1	4,7			4. 8. 6,00	G.
Oct. 16	⊙ S.L. M.....	104.35	3.25,2	29,9	26,1	23,9	28,0	23,9	8,963	+23,87	104.38.49,45	G.
	⊙ N.L.....	104. 5	1.40,7	46,0	42,9	43,0	44,3	41,2			104. 6.42,73	G.
	α Ophiuchi R. M.	183.50	4.27,0	32,3	27,9	27,6	33,2	30,0	6,028	+1.25,14	183.55.54,04	G.
	α Ophiuchi.....	82.55	3. 5,5	9,2	8,2	6,0	9,0	5,2			82.58. 6,65	G.
	α Aquilæ R. M....	179.40	2.19,0	24,9	21,1	19,1	22,3	20,1	10,710	-12,58	179.42. 8,10	G.
	α Aquilæ.....	87.10	1.52,8	56,0	55,1	51,9	54,9	52,0			87.11.53,47	G.
	β Aquilæ R. M....	177.15	1.34,9	39,8	36,9	34,9	41,8	36,1	12,170	-43,06	177.15.54,07	G.
	β Aquilæ.....	89.35	3. 7,3	11,3	8,9	4,8	12,2	7,0			89.38. 8,05	G.
	c Sagittarii.....	123.40	3.28,1	34,0	29,5	26,0	32,5	28,0	15,210	-1.46,52	123.43.29,08	G.
	55 Cam. SP. R. M.	282.15	3.17,0	22,7	17,3	15,9	20,4	18,6			282.16.31,56	G.
	55 Camelopardi SP.	344.35	2.31,0	36,0	31,0	29,2	22,9	31,8			344.37.29,88	G.
	σ Capricorni.....	115.10	3.49,0	53,9	51,0	46,9	51,8	48,1			115.13.49,47	G.
	π Capricorni.....	114.20	1. 2,3	7,1	6,0	2,3	3,9	1,3	10,275	-6,28 -3,57 -3,14	114.21. 3,63	G.
	(b) ⋄ S.L. ....	119. 5	4.14,8	19,2	15,5	11,2	18,6	13,8			119. 9. 8,52	G.
	⋄ S.L. M.....	119. 5	4.14,8	19,2	15,5	11,2	18,6	13,8			119. 9. 8,09	G.
	⋄ S.L. M.....	119. 5	4.14,8	19,2	15,5	11,2	18,6	13,8			119. 9. 7,35	G.
	⋄ S.L. M.....	119. 5	4.14,8	19,2	15,5	11,2	18,6	13,8	10,536	-8,85 +3,14	119. 9. 9,09	G.
	⋄ S.L. M.....	119. 5	4.14,8	19,2	15,5	11,2	18,6	13,8			119. 9. 8,70	G.
	(c) η Capricorni.....	116. 5	0.52,1	56,9	54,1	51,0	53,9	51,8	10,235	-0,50 -0,39 -2,68	116. 5.52,65	G.
	(c) s Capricorni.....	111.25	2.30,0	32,0	31,4	26,6	33,1	29,8			111.27.29,68	G.
	κ Dracon. SP. R. M.	280.30	2.27,2	32,1	28,1	26,8	27,9	29,6			280.32.25,52	G.
	κ Draconis SP.....	346.20	1.39,3	42,3	38,2	36,8	38,3	39,9			346.21.38,85	G.
	β Ceti R. M.....	152.20	3.12,2	17,3	14,0	9,8	13,4	13,4	4,653	-1.53,84	152.25. 6,64	G.
	β Ceti.....	114.25	3.54,0	59,0	56,5	51,8	56,3	53,8			114.28.54,57	G.
	Juno.....	100.15	0.58,7	61,6	61,8	58,4	58,0	58,4			100.15.59,32	G.
	Venus S.L.....	103.30	1.59,9	64,8	63,3	60,3	63,0	59,8			103.32. 1,52	G.
Oct. 17	(d) ⊙ N.L. M.....	104.25	3.32,4	38,4	34,0	32,8	37,8	32,8	9,469	+13,23	104.28.47,31	G.
	⊙ S.L.....	105. 0	0.52,3	58,9	56,0	54,9	58,0	51,9			105. 0.55,18	G.
	Arcturus R. M....	191.15	2.34,0	39,4	34,8	35,3	39,0	36,1	14,887	-1.39,85	191.15.54,13	G.
	Arcturus.....	75.35	3. 3,0	9,0	4,9	2,0	10,0	2,6			75.38. 4,72	G.
Oct. 18	δ Capricorni.....	112.25	3.24,4	28,9	26,5	24,1	28,3	25,9	10,360	-8,94 -5,42 -4,47	112.28.25,77	G.
	(e) ⋄ S.L. ....	108.25	4.25,8	30,0	27,3	24,8	29,0	27,6			108.29.17,73	G.
	⋄ S.L. M.....	108.25	4.25,8	30,0	27,3	24,8	29,0	27,6			108.29.16,78	G.
	⋄ S.L. M.....	108.25	4.25,8	30,0	27,3	24,8	29,0	27,6			108.29.15,45	G.
	⋄ S.L. M.....	108.25	4.25,8	30,0	27,3	24,8	29,0	27,6	10,851	-15,50 +4,47	108.29.15,64	G.
	⋄ S.L. M.....	108.25	4.25,8	30,0	27,3	24,8	29,0	27,6			108.29.16,86	G.
	⋄ S.L. M.....	108.25	4.25,8	30,0	27,3	24,8	29,0	27,6	11,012	-18,75 +8,94	108.29.16,86	G.
Oct. 19	Uranus.....	103. 0	4.50,4	55,1	53,4	51,3	56,3	51,5			103. 4.52,17	G.

Coincidences at the five wires taken Oct. 25, 1½h.

(a) Good.

(b) At the five wires.

(c) At the comb.

(d) Very much fringed.

(e) At the five wires: steady, but seen through misty clouds.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
61,60	29.28.39,37	29,834	48,4	45,7	33,16	0,38			67.16.20,81	$\lambda$ Pegasi.
	28.26.42,35				31,78				66.14.22,41	$\mu$ Pegasi.
	-65.8.16,37				2.5,96				-27.23.14,05	$\alpha$ U. Maj. SP. R.
	-65.8.15,78								-27.23.13,46	$\alpha$ U. Majoris SP.
60,74	59.35.29,60	48,3	46,1		1.39,66	6,66			97.24.17,16	Uranus.
	23.59.52,95				26,10				61.47.27,33	$\alpha$ Androm. R.
	23.59.51,82								61.47.26,20	$\alpha$ Andromedæ.
	56.36.23,25				1.28,71				94.24.53,58	Juno.
61,35	-10.23.43,07	29,984	51,0	50,1	10,72	25,67	13,039	30,61	27.23.14,49	$\alpha$ Ursæ Maj. R.
	-10.23.42,97								27.23.14,59	$\alpha$ Ursæ Majoris.
	60.26.53,50				1.42,13				98.14.47,63	Venus.
	-39.18.55,50				54,2				-1.32.34,60	Polaris SP. R.
61,40	-39.18.55,30				47,38				-1.32.34,40	Polaris SP.
60,35	61.11.48,15	29,980	54,7	55,5	1.44,72	7,52		16.4,60	98.44.29,03	$\odot$ .
	60.39.41,43	29,960	55,8	55,8	1.42,45	7,48			98.44.29,28	$\odot$ .
	39.31.7,26				47,58				77.19.3,12	$\alpha$ Ophiuchi R.
	39.31.5,35								77.19.1,21	$\alpha$ Ophiuchi.
60,79	43.44.53,20	53,3	51,0		55,74				81.32.57,22	$\alpha$ Aquilæ R.
	43.44.52,17								81.32.56,19	$\alpha$ Aquilæ.
	46.11.7,23				1.0,68				83.59.16,19	$\beta$ Aquilæ R.
	46.11.6,75								83.59.15,71	$\beta$ Aquilæ.
61,06	80.16.27,78				5.27,65				118.9.3,71	$c$ Sagittarii.
	-58.49.30,26				1.36,04				-21.3.58,02	55 Camel. SP. R.
	-58.49.31,42								-21.3.59,18	55 Camelop. SP.
	71.46.48,17				49,5				109.36.52,18	$\sigma$ Capricorni.
60,72	70.54.2,33	29,968	51,1	49,0	2.47,22				108.43.57,83	$\pi$ Capricorni.
	75.42.7,22								112.22.47,72	$\delta$ .
	75.42.6,79								112.22.47,29	$\delta$ .
	75.42.6,05				3.45,71	54.46,79			112.22.46,55	$\delta$ .
62,19	75.42.7,79							15.26,70	112.22.48,29	$\delta$ .
	75.42.7,40								112.22.47,90	$\delta$ .
	72.38.51,35				48,7				110.29.4,90	$\eta$ Capricorni.
	68.0.28,38				2.24,03				105.50.0,69	$s$ Capricorni.
60,61	-57.5.24,22	30,032	48,0	45,3	1.30,91	6,67	13,029	30,54	-19.19.46,85	$\kappa$ Draco. SP. R.
	-57.5.22,45								-19.19.45,08	$\kappa$ Draconis SP.
	71.1.54,66				2.49,98				108.51.52,92	$\beta$ Ceti R.
	71.1.53,27								108.51.51,53	$\beta$ Ceti.
59,43	56.48.58,02	30,036	53,0	54,0	1.30,17	7,51		16.4,90	94.37.29,80	Juno.
	60.5.0,22				1.41,24	25,34			97.52.53,86	Venus.
	61.1.46,01				1.46,83	7,55			99.6.36,19	$\odot$ .
	61.33.53,88				36,41				99.6.36,54	$\odot$ .
59,43	32.11.7,17	29,828	50,7	48,8		52.59,61		15.58,91	69.58.51,86	Arcturus R.
	32.11.3,42								69.58.48,11	Arcturus.
	69.1.24,47				2.30,86				106.51.3,61	$\delta$ Capricorni.
	65.2.16,43				48,1				101.42.30,93	$\delta$ .
59,43	65.2.15,48								101.42.29,98	$\delta$ .
	65.2.14,15				2.4,74				101.42.28,65	$\delta$ .
	65.2.14,34								101.42.28,84	$\delta$ .
	65.2.15,56								101.42.30,06	$\delta$ .
	59.37.50,87	30,038	48,3	45,6	1.40,51	0,38			97.26.39,28	Uranus.

Coincidence of Micrometer Wire with fixed Wire =  $10', 107$  at the middle wire. From Oct. 17 =  $10', 096, 10', 100, 10', 103, 10', 108, 10', 114$  at the five wires.

One Micrometer Revolution =  $20'', 873$ .

Correction for Runs =  $-5'', 1$ .

Adopted Zenith Point =  $43^\circ.27'.1'', 30$ .

Assumed Co-latitude =  $37^\circ.47'.8'', 28$ .



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  r. h. m. s.	Correction for Microm. or Time.  ' "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			' "	" "	" "	" "	" "	" "				
Oct. 19	(a) ) S.L. ....	101.45	0.35,5	39,8	37,5	36,3	39,6	37,5				
	) S.L. M. ....	101.45	0.35,5	39,8	37,5	36,3	39,6	37,5	10,322	- 9,68	101.45.27,92	G.
	) S.L. M. ....	101.45	0.35,5	39,8	37,5	36,3	39,6	37,5	10,583	- 4,63	101.45.28,13	G.
	) S.L. M. ....	101.45	0.35,5	39,8	37,5	36,3	39,6	37,5	10,800	- 4,84	101.45.27,58	G.
	) S.L. M. ....	101.45	0.35,5	39,8	37,5	36,3	39,6	37,5	11,041	- 10,02	101.45.28,00	G.
	) S.L. M. ....	101.45	0.35,5	39,8	37,5	36,3	39,6	37,5		- 14,44	101.45.27,92	G.
	λ Piscium. ....	94.40	4.32,9	34,1	35,1	31,3	36,0	34,8		+ 4,84	94.44.33,25	G.
	γ U. Maj. SP. R. M.	296.35	2.27,0	29,9	27,0	27,2	26,4	29,3	14,704	- 19,36	296.35.51,35	G.
	γ Ursæ Majoris SP.	330.15	3.11,8	12,3	11,5	8,9	13,6	13,4		+ 9,68	330.18.11,37	G.
	q Piscium. ....	99.30	3.24,0	26,6	25,0	22,7	27,2	25,2			99.33.24,53	G.
	α Androm. R. M.	199.25	2.31,2	35,2	30,9	31,0	33,7	33,2	11,180	- 22,48	199.27.9,62	G.
	α Andromedæ. ....	67.25	1.51,5	52,6	53,2	48,7	52,2	50,9			67.26.51,20	G.
	δ U. Maj. SP. R. M.	293.15	2.19,0	22,0	18,9	18,7	19,8	21,5	13,375	- 1.8,29	293.16.11,31	G.
	δ Ursæ Majoris SP.	333.35	2.53,7	55,2	54,5	52,9	56,8	54,5			333.37.54,10	G.
	α Cassiopeiæ R. M.	226.50	3.21,2	25,2	21,8	22,2	24,3	23,5	8,957	+ 23,92	226.53.46,39	G.
	α Cassiopeiæ. ....	40.0	0.17,8	16,9	18,1	14,5	16,5	16,9			40.0.16,73	G.
	Juno. ....	100.50	2.29,9	32,2	32,0	28,4	34,9	31,8			100.52.31,12	G.
	α Arietis R. M. ....	193.55	2.31,6	35,0	33,3	32,0	37,5	34,4	11,635	- 31,98	193.57.1,55	G.
	α Arietis. ....	72.55	1.59,4	61,0	62,0	56,4	60,4	59,0			72.56.59,35	G.
Oct. 20	(b) ) S.L. ....	94.30	1.5,9	10,1	8,9	7,4	9,0	6,4			94.31.7,75	G.
	) S.L. M. ....	94.30	1.5,9	10,1	8,9	7,4	9,0	6,4	10,422	- 6,55	94.31.6,21	G.
	) S.L. M. ....	94.30	1.5,9	10,1	8,9	7,4	9,0	6,4	10,697	+ 5,01	94.31.5,60	G.
Oct. 24	α Persei R. M. ....	220.30	1.21,1	24,4	21,3	21,5	25,8	23,4	9,957	- 12,17	220.31.25,72	G.
	α Persei. ....	46.20	2.35,6	37,2	35,9	32,2	40,2	37,0		+ 10,02	46.22.35,87	G.
	η Tauri R. M. ....	194.45	3.33,3	38,4	33,8	32,9	39,3	36,0	2,758	+ 3,05	194.51.8,27	G.
	η Tauri. ....	72.0	2.52,7	54,8	54,5	50,3	54,1	51,3			72.2.52,42	G.
	γ <sup>1</sup> Eridani R. M. ....	157.15	2.23,8	27,0	26,8	24,7	30,0	27,3	6,970	+ 2.33,30	157.18.31,55	G.
	γ <sup>1</sup> Eridani. ....	109.35	0.24,8	30,2	27,5	27,2	29,2	27,8		+ 1.5,40	109.35.27,70	G.
	Α <sup>1</sup> Tauri. ....	74.0	0.44,8	47,3	48,1	43,5	50,5	46,2			74.0.46,58	G.
	(a) ) N.L. M. ....	69.40	1.51,7	54,3	53,0	48,4	56,0	51,7	9,349	+ 15,59	69.42.3,00	G.
	) N.L. M. ....	69.40	1.51,7	54,3	53,0	48,4	56,0	51,7	9,487	- 4,76	69.42.2,58	G.
	) N.L. M. ....	69.40	1.51,7	54,3	53,0	48,4	56,0	51,7	9,590	+ 12,79	69.42.2,88	G.
	) N.L. M. ....	69.40	1.51,7	54,3	53,0	48,4	56,0	51,7	9,740	- 2,38	69.42.2,93	G.
	) N.L. M. ....	69.40	1.51,7	54,3	53,0	48,4	56,0	51,7	9,841	+ 7,68	69.42.2,62	G.
	) N.L. M. ....	69.40	1.51,7	54,3	53,0	48,4	56,0	51,7		+ 2,38		
	) N.L. M. ....	69.40	1.51,7	54,3	53,0	48,4	56,0	51,7		+ 5,69		
	) N.L. M. ....	69.40	1.51,7	54,3	53,0	48,4	56,0	51,7		+ 4,76		
	Venus S.L. ....	100.45	4.20,0	23,4	22,0	19,4	27,2	21,3			100.49.21,42	G.
Oct. 26	(c) ⊙ S.L. M. ....	108.10	3.18,9	24,5	21,9	18,7	24,9	19,7	11,080	- 20,40	108.13.0,42	G.
	⊙ N.L. ....	107.40	0.45,9	52,8	50,8	48,8	51,8	47,4			107.40.49,43	G.
	(d) Arcturus R. M. ....	191.15	2.27,0	30,5	28,1	27,4	31,4	29,4	14,555	1.32,82	191.15.55,65	G.
	Arcturus. ....	75.35	3.2,8	6,4	6,1	0,5	9,2	2,9		- 0,05	75.38.4,30	G.
	Polaris R. M. ....	259.40	1.34,6	39,8	35,0	33,7	38,9	37,0	12,004	+ 0,22	259.40.56,52	G.
	Polaris. ....	7.10	3.9,0	13,6	12,8	7,3	14,2	10,0		- 39,68	7.13.10,57	G.
	Juno. ....	102.5	3.51,0	58,1	54,8	50,5	57,9	52,2			102.8.53,37	G.
	α Arietis R. M. ....	193.55	2.25,1	33,0	28,8	25,2	30,8	28,5	11,233	- 23,59	193.57.4,53	G.
	α Arietis. ....	72.55	1.57,5	62,8	62,4	56,1	61,4	58,1			72.56.59,35	G.
	Venus S.L. ....	100.20	3.59,8	65,1	63,9	59,7	64,8	60,8			100.24.1,62	G.
Oct. 28	Juno. ....	102.25	2.59,1	65,0	63,8	60,9	63,5	61,4			102.28.1,72	G.

Runs taken Oct. 25, 1 $\frac{1}{2}$ h. (Temp. 50°.)

(a) At the five wires; good.

(b) At the 3rd, 4th and 5th wires: cloudy.

(c) Badly defined.

(d) At the 4th and 5th wires: cloudy.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	" / "	Inch.	"	"	" / "	" / "	"	" / "	" / "	"
61,36	58.18.26,62	30,038	48,3	45,6					95.0.23,31	♃.
	58.18.26,83								95.0.23,52	♃.
	58.18.26,28				1.35,43	50.32,20		16.14,82	95.0.22,97	♃.
	58.18.26,70								95.0.23,39	♃.
	58.18.26,62								95.0.23,31	♃.
	51.17.31,95	47,3	42,8		1.14,04				89.5.54,27	♂ Piscium.
	-73.8.50,05				3.13,79				-35.24.55,56	γ U. Maj. SP. R.
	-73.8.49,93								-35.24.55,44	γ Ursæ Maj. SP. R.
	56.6.23,23				1.28,25				93.54.59,76	q Piscium.
	23.59.51,68				26,45				61.47.26,41	α Andromedæ R.
60,41	23.59.49,90								61.47.24,63	α Andromedæ.
62,71	-69.49.10,01				2.40,35				-32.4.42,08	δ U. Maj. SP. R.
	-69.49.7,20								-32.4.39,27	δ Ursæ Maj. SP. R.
61,56	-3.26.45,09				3,58				34.20.19,61	α Cassiopeïæ R.
	-3.26.44,57								34.20.20,13	α Cassiopeïæ.
60,45	57.25.29,82	45,5	42,4		1.32,85	6,71			95.14.4,24	Juno.
	29.29.59,75				33,65				67.17.41,68	α Arietis R.
	29.29.58,05								67.17.39,98	α Arietis.
	51.4.6,45	29,970	47,4	46,3					87.49.9,91	♃.
	51.4.4,91				1.12,75	46.49,14		16.28,43	87.49.8,37	♃.
	51.4.4,30								87.49.7,76	♃.
60,80	2.55.35,58	30,100	49,7	47,5					40.42.46,88	α Persei R.
	2.55.34,57				3,02				40.42.45,87	α Persei.
60,35	28.35.53,03			46,1	32,24				66.23.33,55	η Tauri R.
	28.35.51,12								66.23.31,64	η Tauri.
59,63	66.8.29,75				2.12,97				103.57.51,00	γ <sup>1</sup> Eridani R.
	66.8.26,40				34,92				103.57.47,65	γ <sup>1</sup> Eridani.
	30.33.45,28								68.21.28,48	Α <sup>1</sup> Tauri.
	26.15.1,70		45,2						63.52.33,09	♃.
	26.15.1,28								63.52.32,67	♃.
	26.15.1,58				29,22	26.40,81		16.34,70	63.52.32,97	♃.
	26.15.0,93								63.52.32,32	♃.
	26.15.1,32								63.52.32,71	♃.
59,98	57.22.20,12	30,268	48,0	47,5	1.32,39	22,03	12,650	27,13	95.10.11,63	Venus.
	64.45.59,12	30,260	51,2	51,4	2.4,17	7,79			102.18.56,48	☉.
	64.13.48,13				2.1,24	7,75		16.7,30	102.18.57,20	☉.
63,55	32.11.5,65				37,01				69.58.50,94	Arcturus R.
	32.11.3,00								69.58.48,29	Arcturus.
61,94	-36.13.55,22	30,242	45,0	41,9	43,90				1.32.29,16	Polaris R.
	-36.13.50,73				1.38,29	6,74			1.32.33,65	Polaris.
61,94	58.41.52,07	30,234	43,8	40,8	33,98				96.30.31,90	Juno.
	29.29.56,77								67.17.39,03	α Arietis R.
	29.29.58,05								67.17.40,31	α Arietis.
	56.57.0,32	30,290	45,7	45,0	1.31,45	21,28	12,485	24,65	94.44.54,12	Venus.
	59.1.0,42	30,320	40,5	39,6	1.40,26	6,73			96.49.42,23	Juno.

Coincidence of Micrometer Wire with fixed Wire = 10',096, 10',100, 10',103, 10',108, 10',114 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = -5'',1. From Oct. 24 = -5'',5.

Adopted Zenith Point = 43°.27'.1'',30.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.	Microscopes.						Micrometer, or Time by Molyneux.	Correction for Microm. or Time.	Concluded reading of Circle.	Observer.
			A	B	C	D	E	F				
			° ' "	° ' "	° ' "	° ' "	° ' "	° ' "				
Oct. 28	$\alpha$ Arietis R. M....	193.55	2.29,7	34,7	31,4	28,7	36,1	32,9	11,403	-27,13	193.57.4,65	G.
	$\alpha$ Arietis .....	72.55	1.57,0	60,8	61,0	54,7	61,5	58,0			72.56.58,47	G.
	$\gamma$ Ceti R. M....	173.45	2.26,0	30,9	28,9	25,8	32,8	28,4			173.49.0,90	G.
	$\gamma$ Ceti.....	93.5	0.1,8	4,0	4,1	2,3	4,3	0,9	5,669	+1.32,55	93.5.2,88	G.
	$\pi$ Arietis.....	78.50	1.17,3	19,9	21,3	15,9	25,0	17,3			78.51.19,22	G.
	$\epsilon$ Arietis M.....	74.55	2.25,1	29,9	28,1	25,1	31,0	28,3			74.57.21,30	G.
	$\alpha$ Ceti R. M....	174.40	2.25,1	30,1	28,1	24,8	32,9	28,0	10,399	-6,18	174.42.59,17	G.
	$\alpha$ Ceti.....	92.10	1.3,2	7,0	5,9	2,8	6,7	2,9			92.11.4,55	G.
	$\delta$ Arietis.....	76.30	1.60,2	62,0	64,0	58,1	66,2	59,5			76.32.1,30	G.
Oct. 29	$\gamma$ Aquilæ R. M....	181.25	3.22,1	28,3	25,9	23,1	31,2	26,6	9,066	+21,65	181.28.47,25	G.
	$\gamma$ Aquilæ.....	85.25	0.14,3	20,5	18,1	16,4	20,8	17,7			85.25.17,92	G.
	$\alpha$ Aquilæ R. M....	179.40	1.33,5	39,4	36,9	36,1	42,1	37,2			179.42.10,63	G.
	$\alpha$ Aquilæ.....	87.10	1.50,6	56,0	54,8	52,4	57,2	52,4	8,504	+33,38	87.11.53,57	G.
	$\alpha$ Cygni R. M....	215.55	2.31,3	35,9	33,0	30,6	38,9	33,8			215.57.10,85	G.
	(a) $\alpha$ Cygni.....	50.55	1.51,0	55,0	54,0	48,9	55,9	51,7			50.56.53,02	G.
	(b) $\eta$ Capricorni.....	116.5	0.47,3	54,8	50,9	49,3	55,5	49,2	11,187	-22,62	116.5.51,03	G.
	(b) $\delta$ Capricorni.....	111.25	2.26,0	30,6	27,1	25,4	30,9	27,0			111.27.27,40	G.
	$\alpha$ Cephei R. M....	233.5	3.23,2	26,8	23,2	21,8	30,6	26,2			233.8.47,34	G.
	$\alpha$ Cephei.....	33.45	0.15,3	19,9	17,4	14,0	20,9	16,0	9,018	+22,64	33.45.17,20	G.
	(a) $\delta$ Capricorni M....	112.25	2.56,4	63,0	61,6	58,3	63,6	59,0			112.28.22,48	G.
	$\iota$ Aquarii.....	110.15	1.8,6	16,4	12,8	10,4	14,8	10,9	9,018	+22,88 -0,18	110.16.12,10	G.
	$\theta$ Aquarii.....	104.10	2.44,9	50,0	46,5	44,9	52,2	45,7			104.12.46,87	G.
	(c) $\lambda$ Pegasi.....	72.55	0.34,3	38,6	37,8	33,4	40,2	36,1			72.55.36,63	G.
	(a) $\mu$ Pegasi.....	71.50	3.41,7	44,2	43,3	38,0	48,0	41,8	11,683	+0,27	71.53.42,44	G.
Oct. 30	(d) $\odot$ S.L. M.....	109.30	4.17,2	22,8	19,0	19,4	22,6	19,1			109.33.46,27	G.
	$\odot$ N.L.....	109.0	1.31,5	37,5	32,8	33,0	36,2	34,4			109.1.33,95	G.
	$\alpha$ Lyrae R. M....	209.50	3.16,0	21,9	19,2	17,7	22,2	19,4	11,506	-29,28	209.52.49,54	G.
	$\alpha$ Lyrae.....	57.0	1.11,8	17,4	13,9	10,2	17,4	12,8			57.1.13,70	G.
	$\gamma$ Aquilæ R. M....	181.30	0.19,0	27,3	22,4	21,8	27,5	24,0			181.28.46,19	G.
	$\gamma$ Aquilæ.....	85.25	0.13,8	21,0	17,4	17,0	20,7	17,7	14,770	-1.37,41	85.25.17,88	G.
	$\alpha$ Aquilæ R. M....	179.40	1.32,0	39,0	35,0	35,0	41,8	36,1			179.42.10,22	G.
	$\alpha$ Aquilæ.....	87.10	1.50,3	57,0	55,6	52,8	58,6	53,2	8,472	+34,04	87.11.54,23	G.
	(e) $\alpha$ Cephei R. M....	233.5	2.31,9	36,2	31,6	30,8	38,9	35,0			233.8.44,99	G.
	$\alpha$ Cephei.....	33.45	0.15,4	19,8	17,5	14,5	19,1	17,0	6,682	+1.11,41	33.45.17,17	G.
	$\iota$ Aquarii.....	110.15	1.9,9	15,9	12,9	10,7	19,8	12,0			110.16.13,32	G.
	$\lambda$ Pegasi.....	72.55	0.37,2	42,2	41,0	36,8	44,7	39,4	8,472	+34,04	72.55.40,10	G.
	$\mu$ Pegasi.....	71.50	3.40,8	45,0	44,4	37,9	46,4	41,6			71.53.42,00	G.
Nov. 4	(f) $\odot$ N.L.....	110.35	2.35,0	44,4	39,0	38,0	39,8	38,7	11,720	+0,28 -1,03	110.37.39,21	G.
	$\odot$ S.L.....	111.5	4.49,9	59,8	53,0	52,2	59,5	53,0			111.9.53,15	G.
	Mercury, center...	115.20	3.6,0	14,8	9,9	8,6	12,3	8,9			115.23.9,83	G.
	$\alpha$ Coron. Bor. R. M.	198.30	0.33,2	37,8	34,6	35,9	38,9	37,2	11,075	-33,75	198.30.2,47	G.
	$\alpha$ Coronæ Borealis.	68.20	3.55,8	60,8	59,0	54,2	62,0	57,4			68.23.57,88	G.
	$\alpha$ Aquilæ R. M....	179.40	2.23,8	29,4	27,0	26,3	30,0	29,7			179.42.7,21	G.
	$\alpha$ Aquilæ.....	87.10	1.49,9	55,2	56,1	52,1	58,4	53,7	12,578	-51,66	87.11.54,08	G.
	$\beta$ Aquilæ R. M....	177.15	1.41,0	47,0	45,5	43,9	50,8	45,5			177.15.53,82	G.
	$\beta$ Aquilæ.....	89.35	3.5,8	12,0	11,0	7,1	17,6	10,3			89.38.10,38	G.
	$\lambda$ Pegasi.....	72.55	0.36,8	41,0	41,5	37,2	45,0	39,8	13,788	-1.16,68 -0,31 +0,70	72.55.40,17	G.
	$\mu$ Pegasi.....	71.50	3.40,6	43,8	44,5	38,4	50,8	41,9			71.53.43,03	G.
Nov. 6	(g) $\alpha$ Coron. Bor. R. M.	198.30	1.17,8	22,0	20,3	19,7	24,1	21,4			198.30.3,79	G.
	$\alpha$ Coronæ Borealis.	68.20	3.56,9	61,1	60,2	54,0	65,5	58,0	10,188	-2,15	68.23.59,67	G.
Nov. 9	(h) $\odot$ N.L. M.....	112.5	2.21,8	28,8	24,8	22,9	30,0	24,8			112.7.23,17	G.
	$\odot$ S.L.....	112.35	4.36,9	44,9	41,0	37,8	45,0	39,2			112.39.40,43	G.
Nov. 11	$\odot$ N.L. M.....	112.40	2.26,0	31,0	29,0	26,8	34,8	27,1	13,293	-1.6,96	112.41.21,96	G.
	$\odot$ S.L.....	113.10	3.36,0	41,1	38,0	35,9	43,1	37,7			113.13.38,35	G.

Runs taken Nov. 11, 1 $\frac{1}{2}$ h. (Temp. 51°.)Coincidences at the five wires taken Nov. 19, 1 $\frac{1}{2}$ h.

(a) At the 5th wire.

(b) Cloudy.

(c) Very cloudy.

(d) Misty and cloudy.

(e) Faint blur.

(f) Both limbs taken on the fixed wire, the graduations being bisected for N.L. between the two observa-

tions: N.L. at the 1st wire and S.L. at comb. The respective corrections for change of N.P.D. are +0",44 and -0",66.

(g) At the 5th wire and comb: reflection observation faint. (h) Extremely faint from misty clouds.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	" ' "	Inch.	"	"	"	"	"	"	" ' "	"
61,56	29.29.56,65	30,320	40,5	39,6	34,16				67.17.39,09	$\alpha$ Arietis R.
	29.29.57,17								67.17.39,61	$\alpha$ Arietis.
61,89	49.38.0,40			39,1	1.11,02				87.26.19,70	$\gamma$ Ceti R.
	49.38.1,58								87.26.20,88	$\gamma$ Ceti.
	35.24.17,92				42,95				73.12.9,15	$\pi$ Arietis.
	31.30.20,00				37,04				69.18.5,32	$\epsilon$ Arietis.
61,86	48.44.2,13				1.8,80				86.32.19,21	$\alpha$ Ceti R.
	48.44.3,25								86.32.20,33	$\alpha$ Ceti.
	53.5.0,00				39,37				70.52.47,65	$\delta$ Arietis.
62,59	41.58.14,05	30,236	43,6	42,6	53,79				79.46.16,12	$\gamma$ Aquilæ R.
	41.58.16,62								79.46.18,69	$\gamma$ Aquilæ.
62,10	43.44.50,67				57,23				81.32.56,18	$\alpha$ Aquilæ R.
	43.44.52,27								81.32.57,78	$\alpha$ Aquilæ.
61,94	7.29.50,45			42,2	7,88				45.17.6,61	$\alpha$ Cygni R.
	7.29.51,72								45.17.7,88	$\alpha$ Cygni.
	72.38.49,73		43,0	42,3	3.9,43				110.29.7,44	$\eta$ Capricorni.
	68.0.26,10				2.27,25				105.50.1,63	$s$ Capricorni.
62,27	-9.41.46,04				10,23				28.5.12,01	$\alpha$ Cephei R.
	-9.41.44,10								28.5.13,95	$\alpha$ Cephei.
	69.1.21,18	30,218	42,5	41,5	2.35,16				106.51.4,62	$\delta$ Capricorni.
	66.49.10,80				2.19,14				104.38.38,22	$\iota$ Aquarii.
	60.45.45,57				1.46,73				98.34.40,58	$\theta$ Aquarii.
	29.28.35,33	30,208	42,4	41,7	33,85				67.16.17,46	$\lambda$ Pegasi.
	28.26.41,14				32,44				66.14.21,86	$\mu$ Pegasi.
	66.6.44,97	30,100	46,8	47,9	2.12,29	7,88		16.8,20	103.39.49,46	$\odot$ .
	65.34.32,65				2.9,04	7,85			103.39.50,32	$\odot$ .
61,62	13.34.11,76	30,050	45,3	44,5	14,30				51.21.34,34	$\alpha$ Lyræ R.
	13.34.12,40								51.21.34,98	$\alpha$ Lyræ.
62,04	41.58.15,11	30,040	44,5	43,5	53,34				79.46.16,73	$\gamma$ Aquilæ R.
	41.58.16,58								79.46.18,20	$\gamma$ Aquilæ.
62,23	43.44.51,08				56,76				81.32.56,12	$\alpha$ Aquilæ R.
	43.44.52,93								81.32.57,97	$\alpha$ Aquilæ.
61,08	-9.41.43,69		44,4	43,1	10,15				28.5.14,44	$\alpha$ Cephei R.
	-9.41.44,13								28.5.14,00	$\alpha$ Cephei.
	66.49.12,02		43,8	42,9	2.17,92				104.38.38,22	$\iota$ Aquarii.
	29.28.38,80				33,58				67.16.20,66	$\lambda$ Pegasi.
	28.26.40,70				32,19				66.14.21,17	$\mu$ Pegasi.
	67.10.38,21	29,450	47,8	49,4	2.15,72	7,95		16.9,50	105.16.3,76	$\odot$ .
	67.42.52,15				2.19,30	7,98			105.16.2,25	$\odot$ .
60,18	71.56.8,83	29,460	50,8	52,3	2.53,37	5,85			109.46.4,63	Mercury.
	24.56.58,53				26,59				62.44.33,40	$\alpha$ Coron. Bor. R.
	24.56.56,88								62.44.31,75	$\alpha$ Coronæ Bor.
60,65	43.44.53,79		50,8	49,8	54,95				81.32.57,02	$\alpha$ Aquilæ R.
	43.44.53,08								81.32.56,31	$\alpha$ Aquilæ.
62,10	46.11.7,18				59,82				83.59.15,28	$\beta$ Aquilæ R.
	46.11.9,38								83.59.17,48	$\beta$ Aquilæ.
	29.28.39,17	29,440	48,8	47,9	32,58				67.16.20,03	$\lambda$ Pegasi.
	28.26.42,03				31,22				66.14.21,53	$\mu$ Pegasi.
61,73	24.56.57,21	29,668	48,0	48,1	27,01				62.44.32,50	$\alpha$ Coron. Bor. R.
	24.56.58,67								62.44.33,96	$\alpha$ Coronæ Bor.
	68.40.22,17	29,444	50,7	51,6	2.25,44	8,05		16.10,70	106.45.58,54	$\odot$ .
	69.12.39,43				2.29,51	8,08			106.45.58,44	$\odot$ .
	69.14.20,96	29,172	50,5	50,7	2.28,61	8,08		16.11,20	107.20.0,97	$\odot$ .
	69.46.37,35				2.32,87	8,11			107.19.59,19	$\odot$ .

Coincidence of Micrometer Wire with fixed Wire =  $10^{\circ},103$  at the middle wire. From Nov. 9 =  $10^{\circ},085$ .

One Micrometer Revolution =  $20'',873$ .

Correction for Runs =  $-5'',5$ . From Nov. 4 =  $-2'',4$ .

Adopted Zenith Point =  $43^{\circ}.27'.1'',30$ . From Nov. 4 =  $43^{\circ}.27'.1'',00$ .

Assumed Co-latitude =  $37^{\circ}.47'.8'',28$ .



## 170 ZENITH DISTANCES OBSERVED WITH THE MURAL CIRCLE IN THE YEAR 1839.

Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyoeux.  r. h. m. s.	Correction for Microm. or Time.  ' "	Concluded reading of Circle.  ° ' "	Observer.	
			A	B	C	D	E	F					
			"	"	"	"	"	"					
			"	"	"	"	"	"					
Nov. 12	$\alpha$ Aquarii R. M...	170. 5	4. 28,3	32,2	31,8	29,8	39,8	32,2	9,358	+ 15,18	170. 9. 47,16	G.	
	$\alpha$ Aquarii.....	96. 40	4. 14,3	15,0	15,7	13,8	20,5	14,9			96. 44. 15,37	G.	
	$\theta$ Aquarii.....	104. 10	2. 49,8	51,8	51,1	50,5	56,2	48,7			104. 12. 51,12	G.	
	$\sigma$ Aquarii.....	107. 5	2. 37,8	40,2	39,7	37,8	44,8	38,2			107. 7. 39,55	G.	
	$\lambda$ Pegasi.....	72. 55	0. 38,9	39,4	40,1	37,2	44,7	38,7	10,189	- 2,17	72. 55. 39,78	G.	
	$\mu$ Pegasi.....	71. 50	3. 41,4	41,2	43,1	38,8	50,4	41,1			71. 53. 42,20	G.	
	Uranus.....	103. 10	3. 44,7	47,2	45,0	43,0	50,3	43,8			103. 13. 45,37	G.	
	$\gamma$ Cephei R. M....	247. 55	3. 22,8	24,0	22,8	22,0	27,2	25,1			247. 58. 21,55	G.	
$\gamma$ Cephei.....	18. 55	0. 39,2	39,2	41,3	37,3	43,2	39,8			18. 55. 39,95	G.		
Nov. 13	(a) $\alpha$ Cygni R. M....	215. 55	2. 16,0	18,1	17,0	16,2	22,4	18,3	10,515	- 8,98 - 0,15 + 0,59	215. 57. 8,69	G.	
	$\alpha$ Cygni.....	50. 55	1. 50,4	55,0	53,9	50,8	58,8	52,0			50. 56. 53,92	G.	
Nov. 16	$\lambda$ Ursæ Min. R. M.	260. 5	0. 19,4	21,9	21,0	22,0	27,2	23,3	15,850	- 2. 0,33	260. 3. 22,10	G.	
	$\lambda$ Ursæ Minoris...	6. 50	0. 37,7	38,2	39,9	36,9	45,3	40,3			6. 50. 39,63	G.	
	$\alpha$ Cygni R. M....	215. 55	2. 17,5	20,0	18,5	17,9	24,4	19,3	10,610	- 10,96	215. 57. 8,32	G.	
	$\alpha$ Cygni.....	50. 55	1. 51,2	53,8	53,5	49,3	56,9	51,8			50. 56. 52,50	G.	
	$\lambda$ Pegasi.....	72. 55	0. 37,4	39,0	40,8	35,5	43,4	38,2	18,104	- 2. 47,38	72. 55. 38,97	G.	
	$\mu$ Pegasi.....	71. 50	3. 40,2	42,1	43,3	38,3	48,0	41,0			71. 53. 41,65	G.	
	$\alpha$ U. Maj. SP. R. M.	288. 35	3. 13,0	13,5	14,4	13,8	15,7	15,2			288. 35. 26,45	G.	
	$\alpha$ Ursæ Major. SP.	338. 15	3. 32,0	31,5	32,2	29,0	37,8	33,2			338. 18. 32,15	G.	
	Uranus.....	103. 10	4. 8,0	12,5	9,8	6,3	13,7	8,2	7,633	+ 51,18 - 9,54 - 2,80 - 4,77	103. 14. 9,20	G.	
	$\kappa^1$ Piscium.....	95. 15	0. 42,6	45,4	45,0	43,2	49,8	45,2			95. 15. 45,10	G.	
	$\gamma$ Cephei R. M....	247. 55	2. 29,0	30,4	29,5	28,0	36,4	32,1			247. 58. 21,75	G.	
	$\gamma$ Cephei.....	18. 55	0. 38,1	40,2	40,7	36,8	42,4	39,7			18. 55. 39,57	G.	
	(b) $\delta$ S.L.....	97. 55	3. 6,8	8,1	9,6	6,0	11,8	8,2	10,218		97. 57. 58,46	G.	
	$\delta$ S.L. M.....	97. 55	3. 6,8	8,1	9,6	6,0	11,8	8,2			97. 58. 0,43	G.	
	$\delta$ S.L. M.....	97. 55	3. 6,8	8,1	9,6	6,0	11,8	8,2			97. 57. 59,67	G.	
	$\delta$ S.L. M.....	97. 55	3. 6,8	8,1	9,6	6,0	11,8	8,2			97. 57. 59,40	G.	
	$\delta$ S.L. M.....	97. 55	3. 6,8	8,1	9,6	6,0	11,8	8,2	10,969	- 18,31 + 9,54	97. 57. 59,23	G.	
	$\gamma$ U. Maj. SP. R. M.	296. 35	2. 27,1	28,0	28,4	26,1	29,3	29,1			296. 36. 3,93	G.	
	$\gamma$ Ursæ Major. SP.	330. 15	2. 56,0	55,3	56,4	53,8	62,0	57,9			330. 17. 56,52	G.	
	$\omega$ Piscium.....	89. 40	0. 4,0	4,2	6,8	3,8	12,2	6,3			89. 40. 6,20	G.	
	$d$ Piscium.....	88. 20	0. 42,0	45,1	44,2	42,0	48,8	43,9			88. 20. 44,23	G.	
Nov. 18	F Eridani.....	113. 35	2. 2,2	4,9	5,0	2,3	10,1	4,8	2,768	+ 2. 32,73	113. 37. 4,60	G.	
	$\eta$ Tauri R. M....	194. 45	3. 35,3	39,0	37,0	33,9	43,4	37,9			194. 51. 10,00	G.	
	$\eta$ Tauri.....	72. 0	2. 50,8	51,0	52,7	47,3	53,7	49,8			72. 2. 50,52	G.	
	Aldebaran R. M....	187. 20	4. 17,9	21,2	20,3	18,3	27,2	22,1	5,492	+ 1. 35,87	187. 25. 56,47	G.	
	Aldebaran.....	79. 25	3. 4,0	4,9	6,1	1,1	11,1	4,0			79. 28. 4,78	G.	
Nov. 19	(c) $\odot$ N.L. M.....	114. 45	1. 25,1	29,0	25,9	25,0	29,2	25,9	15,605	- 1. 55,23	114. 44. 31,27	G.	
	Venus S.L.....	100. 20	0. 53,8	57,2	58,9	54,7	59,3	55,0			100. 20. 56,37	G.	
	Arcturus R. M....	191. 15	2. 23,8	26,1	27,5	23,5	30,7	26,3	14,635	- 1. 34,97	191. 15. 51,03	G.	
	Arcturus.....	75. 35	3. 9,7	10,8	13,6	7,1	15,0	10,3			75. 38. 10,65	G.	
Nov. 20	$\odot$ S.L. M.....	115. 30	1. 20,0	23,9	21,8	22,5	25,0	21,8	12,018	- 40,35	115. 30. 41,97	G.	
	$\odot$ N.L. ....	114. 55	3. 20,0	24,1	22,9	20,8	25,0	22,0			114. 58. 22,02	G.	
	(d) Mercury, center..	120. 45	1. 44,8	46,9	47,1	45,9	49,8	45,9	5,520	+ 1. 35,28	120. 46. 46,50	G.	
	$\alpha$ Ophiuchi R. M..	183. 50	4. 11,0	15,8	13,9	11,0	16,3	14,8			183. 55. 48,51	G.	
	$\alpha$ Ophiuchi.....	82. 55	3. 9,7	13,7	13,1	10,0	15,6	11,0			82. 58. 11,75	G.	
	(e) $\epsilon$ Arietis.....	74. 55	2. 15,8	19,8	20,4	14,8	20,8	17,1			74. 57. 18,12	G.	
	$\delta$ Arietis.....	76. 30	1. 59,9	61,9	64,9	58,0	65,9	59,1			76. 32. 1,62	G.	

Runs taken Nov. 19, 1<sup>h</sup>. (Temp. 52°), and Dec. 16, 1<sup>h</sup>. (Temp. 41°.)

(a) At the 4th and 5th wires; not good.

(b) At the five wires.

(c) Very cloudy and unsatisfactory.

(d) Very indefinite and faint.

(e) The runs obtained Dec. 16 are used from this ob-

servation on account of the change of temperature, and are continued (with the exceptions hereafter mentioned) to the end of the year, the temperature being pretty uniform, and no runs being taken till Jan. 1, when the amount was - 7",5 and Temp. 50°.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
61,27	53.17.13,84 53.17.14,37 60.45.50,12 63.40.38,55 29.28.38,78 28.26.41,20 59.46.44,37	29,486	49,4	48,4 47,9	1.17,19 1.42,67 1.56,16 32,63 31,27 1.38,79	0,38			91.5.39,31 91.5.39,84 98.34.41,07 101.29.42,99 67.16.19,69 66.14.20,75 97.35.31,06	$\alpha$ Aquarii R. $\alpha$ Aquarii. $\theta$ Aquarii. $\sigma$ Aquarii. $\lambda$ Pegasi. $\mu$ Pegasi. Uranus.
60,75	-24.31.20,55 -24.31.21,05				26,34				13.15.21,39 13.15.20,89	$\gamma$ Cephei R. $\gamma$ Cephei.
61,31	7.29.52,31 7.29.52,92	29,790	48,8	47,6	7,68				45.17.8,27 45.17.8,88	$\alpha$ Cygni R. $\alpha$ Cygni.
60,87	-36.36.21,10 -36.36.21,37	29,814	52,4	50,9	43,08				1.10.4,10 1.10.3,83	$\lambda$ Ursæ Min. R. $\lambda$ Ursæ Minoris.
60,41	7.29.52,68 7.29.51,50 29.28.37,97 28.26.40,65	29,844	50,3	49,2	7,64 32,94 31,56				45.17.8,60 45.17.7,42 67.16.19,19 66.14.20,49	$\alpha$ Cygni R. $\alpha$ Cygni. $\lambda$ Pegasi. $\mu$ Pegasi.
59,30	-65.8.25,45 -65.8.28,85 59.47.8,20 51.48.44,10				2.5,11 1.39,74 1.13,96	0,37			-27.23.22,28 -27.23.25,68 97.35.55,85 89.37.6,34	$\alpha$ U. Maj. SP. R. $\alpha$ Ursæ Maj. SP. Uranus. $\kappa^1$ Piscium.
60,66	-24.31.20,75 -24.31.21,43 54.30.57,46 54.30.59,43 54.30.58,67 54.30.58,40 54.30.58,23				26,59 1.21,57	48.0,48		16.7,92	13.15.20,94 13.15.20,26 91.15.18,91 91.15.20,88 91.15.20,12 91.15.19,85 91.15.19,68	$\gamma$ Cephei R. $\gamma$ Cephei. J. J. J. J.
60,23	-73.9.2,93 -73.9.4,48 46.13.5,20 44.53.43,23			48,4	3.10,03 1.0,74 58,10				-35.25.4,68 -35.25.6,23 84.1.14,22 82.41.49,61	$\gamma$ U. Maj. SP. R. $\gamma$ Ursæ Maj. SP. $\omega$ Piscium. $d$ Piscium.
60,26	70.10.3,60 28.35.51,00 28.35.49,52	29,900	49,3	47,5	2.41,02 31,94				107.59.52,90 66.23.31,22 66.23.29,74	F Eridani. $\eta$ Tauri R. $\eta$ Tauri.
60,63	36.1.4,53 36.1.3,78				42,58				73.48.55,39 73.48.54,64	Aldebaran R. Aldebaran.
60,84	71.17.30,27 56.53.55,37 32.11.9,97 32.11.9,65	29,876 29,952 29,978	50,6 47,4 45,8	50,1 45,0 44,4	2.50,24 1.30,26 37,20	8,20 14,89	11,739	16.12,90 18,01	109.23.33,49 94.42.1,01 69.58.55,45 69.58.55,13	$\odot$ . Venus. Arcturus R. Arcturus.
60,13	72.3.40,97 71.31.21,02 77.19.45,50 39.31.12,49 39.31.10,75 31.30.17,12 33.5.0,62	29,980 29,840	47,0 48,2 41,4	47,2 48,0 39,9	2.59,59 2.54,10 4.15,24 48,38 36,40 38,68	8,24 8,22 6,90		16.13,10	109.37.27,50 109.37.28,28 115.11.2,12 77.19.9,15 77.19.7,41 69.18.1,80 70.52.47,58	$\odot$ . $\odot$ . Mercury. $\alpha$ Ophiuchi R. $\alpha$ Ophiuchi. $\epsilon$ Arietis. $\delta$ Arietis.

Coincidence of Micrometer Wire with fixed Wire = 10',078, 10',084, 10',085, 10',088, 10',092 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = -2'',4. From Nov. 16 = -4'',0. From  $\epsilon$  Arietis Nov. 20 = +0'',1.

Adopted Zenith Point = 43°.27'.1'',00.

Assumed Co-latitude 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  r. h. m. s.	Correction for Microm. or Time.  " "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
Nov. 20	(a) » N.L. M.....	71. 45	2. 61,2	63,0	66,4	57,8	67,5	60,2	8,563	+ 31,62 - 6,28	71. 48. 28,04	G.
	» N.L. M.....	71. 45	2. 61,2	63,0	66,4	57,8	67,5	60,2	8,730	+ 28,25 - 3,14	71. 48. 27,81	G.
	» N.L. M.....	71. 45	2. 61,2	63,0	66,4	57,8	67,5	60,2	8,907	+ 24,59	71. 48. 27,29	G.
	» N.L. M.....	71. 45	2. 61,2	63,0	66,4	57,8	67,5	60,2	9,039	+ 21,89 + 3,14	71. 48. 27,73	G.
	» N.L. M.....	71. 45	2. 61,2	63,0	66,4	57,8	67,5	60,2	9,222	+ 18,16 + 6,28	71. 48. 27,14	G.
	A <sup>1</sup> Tauri.....	74. 0	0. 44,0	46,1	48,8	41,0	48,8	43,8			74. 0. 45,42	G.
	v <sup>1</sup> Tauri.....	73. 10	2. 25,1	26,4	29,8	21,8	32,0	25,8			73. 12. 26,82	G.
Nov. 21	A <sup>1</sup> Tauri.....	74. 0	0. 44,3	46,0	49,8	42,5	48,2	44,8			74. 0. 45,93	G.
	v <sup>1</sup> Tauri.....	73. 10	2. 26,8	28,5	30,9	23,6	33,0	26,9			73. 12. 28,28	G.
	(a) » N.L. M.....	68. 30	2. 13,4	14,8	17,7	9,4	17,5	13,2	11,014	- 19,55 - 3,22	68. 31. 51,56	G.
	» N.L. M.....	68. 30	2. 13,4	14,8	17,7	9,4	17,5	13,2	11,100	- 21,21 - 1,61	68. 31. 51,51	G.
	» N.L. M.....	68. 30	2. 13,4	14,8	17,7	9,4	17,5	13,2	11,140	- 22,01	68. 31. 52,32	G.
	» N.L. M.....	68. 30	2. 13,4	14,8	17,7	9,4	17,5	13,2	11,230	- 23,83 + 1,61	68. 31. 52,11	G.
	» N.L. M.....	68. 30	2. 13,4	14,8	17,7	9,4	17,5	13,2	11,330	- 25,84 + 3,22	68. 31. 51,71	G.
	Venus S.L.....	100. 40	0. 51,8	54,0	55,9	53,0	56,8	53,4			100. 40. 54,15	G.
	λ Ursæ Min. R. M.	260. 5	0. 27,0	29,8	28,0	28,3	32,9	30,8	16,204	- 2. 7,73	260. 3. 21,74	G.
	λ Ursæ Minoris...	6. 50	0. 38,2	39,9	42,5	38,0	45,2	41,2			6. 50. 40,83	G.
	α Cygni R. M. ...	215. 55	2. 15,9	17,3	19,1	15,8	22,1	18,9	10,629	- 11,35	215. 57. 6,83	G.
Nov. 22	α Cygni.....	50. 55	1. 51,0	53,0	55,0	49,3	55,2	51,4			50. 56. 52,48	G.
	α Aquarii R. M...	170. 10	0. 24,2	27,3	28,4	25,5	30,8	28,8	11,990	- 39,76	170. 9. 47,74	G.
	α Aquarii.....	96. 40	4. 9,7	11,1	15,0	9,1	15,8	13,0			96. 44. 12,30	G.
	λ Pegasi.....	72. 55	0. 36,4	36,2	40,8	34,8	40,9	38,1			72. 55. 37,87	G.
	μ Pegasi.....	71. 50	3. 38,8	39,1	32,9	35,7	44,6	40,1			71. 53. 38,55	G.
	Uranus.....	103. 10	4. 10,8	14,2	14,8	9,8	17,0	12,1			103. 14. 13,13	G.
	Polaris R. M.....	259. 40	1. 29,0	30,9	31,4	29,8	33,4	33,1	11,388	- 27,19	259. 41. 4,08	G.
	Polaris.....	7. 10	2. 57,8	57,6	62,7	55,9	64,9	60,0			7. 12. 59,83	G.
	Aldebaran R. M...	187. 20	4. 15,5	19,4	19,4	15,4	22,8	20,0	5,439	+ 1. 36,97	187. 25. 55,74	G.
	Aldebaran.....	79. 25	2. 60,7	60,9	65,2	58,3	63,2	61,9			79. 28. 1,72	G.
	Capella R. M. ....	217. 0	4. 22,0	24,9	25,7	19,4	26,9	24,8	11,162	- 22,48	217. 4. 1,49	G.
	Capella.....	49. 45	4. 59,0	60,3	63,4	55,3	65,8	60,3			49. 50. 0,70	G.
	β Tauri R. M.....	199. 40	2. 14,0	17,5	18,4	15,0	17,8	18,8	9,004	+ 22,56	199. 42. 39,48	G.
	β Tauri.....	67. 10	1. 19,1	21,1	24,0	17,2	22,8	21,1			67. 11. 20,88	G.
	ι Aurigæ.....	65. 15	0. 52,8	54,9	58,1	51,2	57,0	53,1			65. 15. 54,52	G.
	(b) α Columbæ.....	129. 35	1. 47,2	50,8	53,3	48,1	53,2	50,1			129. 36. 50,45	G.
	C Tauri.....	68. 5	0. 11,8	12,1	15,8	9,4	15,1	13,1			68. 5. 12,88	G.
	(a) » N.L. M.....	67. 30	0. 33,5	34,8	37,3	29,9	38,8	35,2	9,151	+ 19,36 + 0,30	67. 30. 54,58	G.
	» N.L. M.....	67. 30	0. 33,5	34,8	37,3	29,9	38,8	35,2	9,149	+ 19,52 + 0,15	67. 30. 54,59	G.
	» N.L. M.....	67. 30	0. 33,5	34,8	37,3	29,9	38,8	35,2	9,168	+ 19,15	67. 30. 54,07	G.
	» N.L. M.....	67. 30	0. 33,5	34,8	37,3	29,9	38,8	35,2	9,145	+ 19,68 - 0,15	67. 30. 54,45	G.
	» N.L. M.....	67. 30	0. 33,5	34,8	37,3	29,9	38,8	35,2	9,151	+ 19,64 - 0,30	67. 30. 54,26	G.
	Venus S.L.....	100. 50	1. 40,2	42,2	45,0	40,6	47,9	42,9			100. 51. 43,13	G.
	Spica R. M.....	160. 55	2. 36,0	39,2	39,3	35,1	44,8	38,8	12,758	- 55,79	160. 56. 43,09	G.
	Spica.....	105. 55	2. 16,2	18,3	21,1	15,4	20,8	17,6			105. 57. 18,23	G.
Nov. 23	⊙ N.L. M.....	115. 35	3. 29,2	32,2	33,2	29,8	38,0	30,9	12,054	- 41,10	115. 37. 51,13	G.
	⊙ S.L.....	116. 10	0. 8,9	14,1	13,3	10,3	15,4	9,3			116. 10. 11,88	G.
	α Cygni R. M.....	215. 55	2. 20,0	26,4	23,7	20,0	29,1	22,9	10,819	- 15,32	215. 57. 8,36	G.
	α Cygni.....	50. 55	1. 51,4	55,5	55,7	50,1	56,4	52,2			50. 56. 53,55	G.

(a) At the five wires.

(b) Refraction calculated by Bessel's Supplementary Tables.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
	28.21.27,04	29,800	41,0	38,8					65.56.55,59	♃.
	28.21.26,81								65.56.55,36	♃.
	28.21.26,29				32,09	28.55,34		16.43,52	65.56.54,84	♃.
	28.21.26,73								65.56.55,28	♃.
	28.21.26,14								65.56.54,69	♃.
	30.33.44,42	29,784	40,6	38,4	35,11				68.21.27,81	A <sup>1</sup> Tauri.
	29.45.25,82	29,772	40,2	38,2	34,00				67.33.8,10	♃ <sup>1</sup> Tauri.
	30.33.44,93	29,700	40,0	37,0	35,12				68.21.28,33	A <sup>1</sup> Tauri.
	29.45.27,28				34,00				67.33.9,56	♃ <sup>1</sup> Tauri.
	25.4.50,56	29,706	39,6	36,4					62.43.25,17	♃.
	25.4.50,51								62.43.25,12	♃.
	25.4.51,32				27,87	25.40,96		16.39,42	62.43.25,93	♃.
	25.4.51,11								62.43.25,72	♃.
	25.4.50,71								62.43.25,32	♃.
	57.13.53,15	29,860	43,6	42,3	1.31,64	14,52	11,721	17,84	95.2.0,71	Venus.
61,29	-36.36.20,74	29,980	43,4	41,1	44,20				1.10.3,34	λ Ursæ Min. R.
	-36.36.20,17								1.10.3,91	λ Ursæ Minoris.
59,66	7.29.54,17				7,84				45.17.10,29	α Cygni R.
	7.29.51,48								45.17.7,60	α Cygni.
60,02	53.17.13,26	30,020	42,0	40,4	1.19,89				91.5.41,43	α Aquarii R.
	53.17.11,30								91.5.39,47	α Aquarii.
	29.28.36,87	30,032	41,6	39,9	33,78				67.16.18,93	λ Pegasi.
	28.26.37,55				32,38				66.14.18,21	μ Pegasi.
	59.47.12,13				1.42,32	0,37			97.36.2,36	Uranus.
61,96	-36.14.3,08	30,050	40,9	38,9	43,91				1.32.21,29	Polaris R.
	-36.14.1,17								1.32.23,20	Polaris.
58,73	36.1.5,26	30,070	39,8	37,8	43,69				73.48.57,23	Aldebaran R.
	36.1.0,72								73.48.52,69	Aldebaran.
61,10	6.22.59,51	30,076	39,4	37,0	6,74				44.10.14,53	Capella R.
	6.22.59,70								44.10.14,72	Capella.
60,18	23.44.21,52				26,49				61.31.56,29	β Tauri R.
	23.44.19,88								61.31.54,65	β Tauri.
	21.48.53,52				24,11				59.36.25,91	ι Aurigæ.
	86.9.49,45				12.34,57				124.9.32,30	α Columbæ.
	24.38.11,88				27,62				62.25.47,78	C Tauri.
	24.3.53,53			36,7					61.43.30,95	♃.
	24.3.53,59								61.43.30,96	♃.
	24.3.53,07				26,91	24.27,70		16.29,88	61.43.30,44	♃.
	24.3.53,45								61.43.30,82	♃.
	24.3.53,26								61.43.30,63	♃.
60,66	57.24.42,13	30,136	40,3	36,9	1.34,18	14,34	11,679	17,39	95.12.52,86	Venus.
	62.30.17,91				1.55,51				100.19.21,70	Spica R.
	62.30.17,23								100.19.21,02	Spica.
	72.10.50,13	30,158	41,4	41,1	3.4,26	8,25		16.13,60	110.17.8,02	☉.
	72.43.10,88				3.10,24	8,28			110.17.7,52	☉.
60,96	7.29.52,64	30,150	42,9	41,4	7,88				45.17.8,80	α Cygni R.
	7.29.52,55								45.17.8,71	α Cygni.

Coincidence of Micrometer Wire with fixed Wire = 10',078, 10',084, 10',085, 10',088, 10',092 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = + 0'',1.

Adopted Zenith Point = 43°.27'.1'',00.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  r. h. m. s.	Correction for Microm. or Time.  ' "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
Nov. 23	λ Pegasi.....	72.55	0.35,0	39,0	40,3	33,1	42,3	36,9			72.55.37,77	G.
	μ Pegasi.....	71.50	3.39,0	41,9	43,9	36,1	43,0	39,3			71.53.40,55	G.
	Uranus.....	103.10	4.6,0	13,0	10,3	5,2	12,4	7,4			103.14.9,07	G.
Nov. 25	(a) ⊙ N.L. M.....	116.0	3.20,4	27,5	23,0	20,9	29,8	22,7	12,670	-53,96	116.2.29,64	G.
	⊙ S.L. ....	116.30	4.50,0	55,5	52,2	51,3	61,0	51,0			116.34.52,85	G.
Nov. 26	⊙ S.L. M.....	116.45	2.24,7	33,0	27,3	27,1	30,1	25,9	12,970	-1.0,22	116.46.27,48	G.
	⊙ N.L. ....	116.10	4.4,2	11,7	6,0	4,2	9,3	5,3			116.14.6,23	G.
	(b) α Lyrae R. M....	209.50	3.22,2	27,0	24,9	23,0	28,0	24,4	11,990	-39,76	209.52.44,71	G.
	α Lyrae.....	57.0	1.17,7	19,9	18,9	12,5	24,8	17,9			57.1.18,45	G.
	α Cygni R. M....	215.55	2.28,8	35,0	30,8	28,1	37,6	31,5	11,221	-23,72	215.57.8,26	G.
	α Cygni.....	50.55	1.52,0	55,8	55,9	49,0	56,8	52,2			50.56.53,62	G.
	β Cephei R. M....	241.5	0.9,0	12,0	10,2	8,8	14,0	12,1	8,791	+27,00	241.5.38,02	G.
	β Cephei.....	25.45	3.24,5	26,8	26,0	19,9	31,1	26,3			25.43.25,78	G.
	λ Pegasi.....	72.55	0.36,7	38,9	40,9	34,1	43,0	37,7			72.55.38,55	G.
	μ Pegasi.....	71.50	3.39,9	41,9	44,4	35,8	48,3	40,5			71.53.41,82	G.
	Uranus M.....	103.10	3.21,4	26,9	24,3	19,7	29,4	23,9	8,605	+30,89	103.13.55,17	G.
	β U. Min. SP. R. M.	276.25	1.24,0	26,9	25,3	23,9	29,2	28,1	15,658	-1.56,33	276.24.29,90	G.
	β Ursæ Minoris SP.	350.25	4.31,4	33,3	34,3	28,5	38,4	34,1			350.29.33,35	G.
	η Tauri R. M....	194.45	4.30,3	34,4	32,7	28,5	38,7	33,8	5,368	+1.38,46	194.51.11,54	G.
	η Tauri.....	72.0	2.50,0	51,3	55,0	46,4	53,4	50,8			72.2.51,17	G.
	ζ U. Min. SP. R. M.	272.55	2.26,8	31,2	28,8	26,2	29,8	30,3	13,818	-1.17,92	272.56.10,93	G.
	ζ Ursæ Minoris SP.	353.55	2.53,0	57,2	57,9	50,8	60,9	55,2			353.57.55,85	G.
	Venus S.L.....	101.40	0.29,7	33,0	34,1	29,6	37,1	32,4			101.40.32,65	G.
Nov. 27	⊙ N.L. M.....	116.25	0.29,6	34,8	34,4	31,4	36,4	32,6	10,516	-9,00	116.25.24,20	G.
	⊙ S.L. ....	116.55	2.44,2	49,7	48,8	44,8	52,0	45,4			116.57.47,50	G.
Nov. 28	Polaris R. M....	259.40	1.26,0	30,8	29,0	26,8	32,4	30,3	11,179	-22,83	259.41.6,39	G.
	Polaris.....	7.10	2.51,9	55,3	57,9	49,8	59,7	53,5			7.12.54,70	G.
	β U. Min. SP. R. M.	276.20	4.17,8	22,4	21,2	16,3	26,8	21,4	9,588	+10,38	276.24.31,38	G.
	β Ursæ Minoris SP.	350.25	4.28,4	30,1	31,8	26,1	36,9	30,9			350.29.30,72	G.
	α Persei R. M....	220.30	2.18,4	26,1	22,5	20,7	26,3	22,7	12,375	-47,80	220.31.34,98	G.
	α Persei.....	46.20	2.25,1	29,8	29,2	23,4	35,8	28,4			46.22.28,62	G.
Nov. 29	(c) ⋮ S.L.....	100.5	2.54,0	58,0	59,2	53,9	66,3	55,8		+4,01	100.8.1,89	G.
	⋮ S.L. M.....	100.5	2.54,0	58,0	59,2	53,9	66,3	55,8	9,920	+3,44	100.8.1,32	G.
	⋮ S.L. M.....	100.5	2.54,0	58,0	59,2	53,9	66,3	55,8	9,740	+7,26	100.8.1,13	G.
	⋮ S.L. M.....	100.5	2.54,0	58,0	59,2	53,9	65,3	55,8	9,552	+11,27	100.8.1,13	G.
	Polaris SP. R. M..	262.45	2.34,8	38,0	37,4	34,8	42,2	38,8	15,683	-1.56,86	262.45.40,82	G.
	Polaris SP.....	4.5	3.19,6	21,1	23,1	17,4	30,0	20,7			4.8.22,00	G.
	Venus S.L.....	102.20	2.2,1	8,4	8,4	3,4	13,0	4,7			102.22.6,67	G.
Nov. 30	(d) ⋮ S.L. M.....	105.50	1.35,3	40,0	41,3	37,5	46,7	38,1	11,110	-21,54	105.51.25,98	G.
	⋮ S.L. M.....	105.50	1.35,3	40,0	41,3	37,5	46,7	38,1	10,900	+7,70	105.51.26,63	G.
	⋮ S.L. M.....	105.50	1.35,3	40,0	41,3	37,5	46,7	38,1	10,746	-17,04	105.51.26,03	G.
	⋮ S.L. M.....	105.50	1.35,3	40,0	41,3	37,5	46,7	38,1	10,588	+3,85	105.51.25,53	G.
	⋮ S.L. M.....	105.50	1.35,3	40,0	41,3	37,5	46,7	38,1	10,363	-13,79	105.51.25,53	G.
	⋮ S.L. M.....	105.50	1.35,3	40,0	41,3	37,5	46,7	38,1	10,363	-10,44	105.51.25,53	G.
	⋮ S.L. M.....	105.50	1.35,3	40,0	41,3	37,5	46,7	38,1	10,363	-3,85	105.51.25,53	G.
	⋮ S.L. M.....	105.50	1.35,3	40,0	41,3	37,5	46,7	38,1	10,363	-5,65	105.51.26,47	G.
Dec. 3	Polaris SP. R. M..	262.45	2.26,7	30,0	30,9	27,3	35,3	30,9	15,393	-7,70	262.45.39,38	G.
	Polaris SP.....	4.5	3.20,4	23,2	24,6	18,0	30,6	23,8		-1.50,80	4.8.23,45	G.
	Venus S.L.....	103.20	2.37,0	41,5	40,7	36,9	43,8	40,3			103.22.40,05	G.
Dec. 3	Arcturus R. M....	191.15	2.20,0	22,9	23,1	20,4	28,5	23,9	14,693	-1.35,68	191.15.47,45	G.
	Arcturus.....	75.35	3.10,9	13,8	15,5	7,7	21,8	12,4			75.38.13,70	G.

Coincidences at the five wires taken Dec. 16, 1<sup>h</sup>.

(a) Microscopes misty from increased temperature.

(b) Cloudy.

(c) At the 2nd, 3rd, 4th and 5th wires.

(d) At the five wires.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.			
			Attach.	Free.									
"	° ' "	Inch.	°	°	' "	' "	"	' "	° ' "				
61,58	29.28.36,77	30,158	41,4	39,4	33,96	0,37			67.16.19,01	λ Pegasi.			
	28.26.39,55				32,55				66.14.20,38	μ Pegasi.			
	59.47.8,07				1.42,86				97.35.58,84	Uranus.			
	72.35.28,64	29,500	51,0	52,5	3.0,36	8,27	16.14,00	110.41.43,01	⊙.				
	73.7.51,85				3.6,35			8,30	110.41.44,18	⊙.			
	73.19.26,48	29,300	44,5	45,0	3.10,24	8,31	16.14,20	110.53.22,49	⊙.				
	72.47.5,23				3.4,06			8,28	110.53.23,49	⊙.			
	13.34.16,29	29,292	45,2	44,8	13,94			51.21.38,51	α Lyrae R.				
	13.34.17,45							51.21.39,67	α Lyrae.				
	60,94	7.29.52,74		43,5	41,2	7,66			45.17.8,68	α Cygni R.			
7.29.52,62	45.17.8,56	α Cygni.											
61,90	-17.38.37,02			40,4	18,53				20.8.12,73	β Cephei R.			
	-17.38.35,22								20.8.14,53	β Cephei.			
	29.28.37,55								41,3	38,8	33,03	67.16.18,86	λ Pegasi.
	28.26.40,82										31,65	66.14.20,75	μ Pegasi.
61,63	59.46.54,17				1.40,02	0,37			97.35.42,10	Uranus.			
	-52.57.28,90								38,4	36,5	1.17,67	-15.11.38,29	β U. Min. SP. R.
	-52.57.27,65										1.17,67	-15.11.37,04	β Ursæ Min. SP.
	28.35.49,46								38,0	35,4	32,08	66.23.29,82	η Tauri R.
28.35.50,17	66.23.30,53	η Tauri.											
63,39	-49.29.9,93				1.8,79				-11.43.10,44	ζ U. Min. SP. R.			
	-49.29.5,15								-11.43.5,66	ζ Ursæ Min. SP.			
	58.13.31,65								29,350	39,7	35,0	1.35,03	13,68
60,54	72.58.23,20	29,354	38,6	38,5	3.9,10	8,29		16.14,30	111.4.46,59	⊙.			
	73.30.46,50				3.15,49				8,32	111.4.47,65	⊙.		
	-36.14.5,39	29,532	42,4	40,5	43,01				1.32.19,88	Polaris R.			
	-36.14.6,30								1.32.18,97	Polaris.			
61,05	-52.57.30,38	29,520	41,5	40,4	1.17,64				-15.11.39,74	β U. Min. SP. R.			
	-52.57.30,28								-15.11.39,64	β Ursæ Min. SP.			
61,80	2.55.26,02				3,00				40.42.37,30	α Persei R.			
	2.55.27,62								40.42.38,90	α Persei.			
61,41	56.41.0,89	29,466	43,7	43,0	1.28,44	45.29,20		14.53,48	93.29.14,93	⋮.			
	56.41.0,32								93.29.14,36	⋮.			
	56.41.0,13								93.29.14,17	⋮.			
	56.41.0,13	29,488	43,3	42,6	47,77				93.29.14,17	⋮.			
	-39.18.39,82								-1.32.19,31	Polaris SP. R.			
	-39.18.39,00								-1.32.18,49	Polaris SP.			
	58.55.5,67	29,500	43,4	42,3	1.36,64	13,23	11,590	16,40	96.43.20,96	Venus.			
	62.24.24,98	29,620	41,0	36,2	1.53,23	47.55,75		14.47,31	99.10.43,43	⋮.			
	62.24.25,63								99.10.44,08	⋮.			
	62.24.25,03								99.10.43,48	⋮.			
	62.24.24,53								99.10.42,99	⋮.			
61,42	62.24.25,47				48,62				99.10.43,93	⋮.			
	-39.18.38,38								-1.32.18,72	Polaris SP. R.			
	-39.18.37,55								-1.32.17,89	Polaris SP.			
	59.55.39,05								29,772	38,4	32,6	1.43,60	12,69
60,58	32.11.13,55	29,758	36,2	31,4	37,95				69.58.59,78	Arcturus R.			
	32.11.12,70								69.58.58,93	Arcturus.			

Coincidence of Micrometer Wire with fixed Wire = 10',078, 10',084, 10',085, 10',088, 10',092 at the five wires.

From Dec. 3 = 10',102, 10',111, 10',109, 10',115, 10',125.

One Micrometer Revolution = 20'',873.

Correction for Runs = + 0'',1. For the Sun Nov. 25 and 26 and α Lyrae Nov. 26, the Runs of Nov. 19 are used.

Adopted Zenith Point = 43°.27'.1'',00.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  r. h. m. s.	Correction for Microm. or Time.  ' "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
Dec. 5	α Aquarii R. M....	170. 10	4. 17,8	23,2	22,8	18,4	31,0	23,2	23,162	-4. 32,45	170. 9. 50,30	G.
	α Aquarii .....	96. 40	4. 9,3	12,5	13,4	7,9	19,0	12,0			96. 44. 12,37	G.
Dec. 7	β Cephei R. M....	241. 0	4. 11,9	16,6	14,1	11,3	22,1	16,9	6,159	+1. 22,45	241. 5. 37,95	G.
	β Cephei .....	25. 45	3. 24,2	27,2	25,2	19,8	30,5	24,5			25. 48. 25,25	G.
	(a) λ Pegasi .....	72. 55	0. 34,8	38,3	40,0	31,8	44,1	35,8	7,588	+0,25	72. 55. 37,72	G.
	μ Pegasi .....	71. 50	3. 38,1	43,0	43,0	34,9	48,1	39,8			71. 53. 41,17	G.
	Uranus .....	103. 10	1. 17,3	22,6	20,9	16,7	25,2	19,2	13,961	-1. 20,40	103. 11. 20,32	G.
	γ Cephei R. M....	247. 55	2. 29,8	33,2	31,9	28,9	39,1	33,8			247. 58. 25,41	G.
	γ Cephei .....	18. 55	0. 36,3	38,8	40,4	33,0	42,1	38,2			18. 55. 38,13	G.
Dec. 12	Venus S.L. ....	105. 50	4. 31,4	34,7	35,8	30,2	41,5	33,7	7,978	+44,49	105. 54. 34,57	G.
	Jupiter S.L. ....	109. 20	3. 32,4	36,1	36,8	30,8	40,3	34,8			109. 23. 35,22	G.
	ε Bootis R. M....	198. 55	3. 45,0	49,0	48,1	44,8	56,5	49,2	11,904	-37,46	198. 59. 33,27	G.
	ε Bootis .....	67. 50	4. 26,7	27,9	30,7	21,4	35,2	28,5			67. 54. 28,42	G.
	β Ursæ Min. R. M.	246. 0	3. 17,9	21,9	21,2	17,0	25,1	22,9	13,961	-1. 20,40	246. 2. 0,62	G.
	β Ursæ Minoris...	20. 50	1. 59,6	60,5	64,8	56,4	67,5	60,5			20. 52. 1,55	G.
	α Coron. Bor. R. M.	198. 30	0. 25,3	28,0	28,0	25,3	33,2	28,0	11,904	-37,46	198. 29. 50,51	G.
	α Coronæ Borealis.	68. 20	4. 7,0	10,0	10,7	2,8	18,9	8,4			68. 24. 9,65	G.
Dec. 13	(b) S.L. ....	100. 15	4. 6,0	11,3	11,2	5,7	18,3	9,8	10,270	-9,04	100. 19. 1,36	G.
	» S.L. M. ....	100. 15	4. 6,0	11,3	11,2	5,7	18,3	9,8			100. 19. 2,56	G.
	» S.L. M. ....	100. 15	4. 6,0	11,3	11,2	5,7	18,3	9,8	10,481	-7,76	100. 19. 2,64	G.
	» S.L. M. ....	100. 15	4. 6,0	11,3	11,2	5,7	18,3	9,8			100. 19. 2,45	G.
	» S.L. M. ....	100. 15	4. 6,0	11,3	11,2	5,7	18,3	9,8	10,913	-16,45	100. 19. 2,99	G.
	» S.L. M. ....	100. 15	4. 6,0	11,3	11,2	5,7	18,3	9,8			100. 19. 2,99	G.
Dec. 14	⊙ S.L. M. ....	119. 5	1. 20,1	28,0	24,0	20,5	29,2	24,0	13,069	-1. 1,79	119. 5. 22,51	G.
	⊙ N.L. ....	118. 30	2. 54,2	60,0	58,4	55,3	64,9	57,4			118. 32. 58,38	G.
	(c) S.L. ....	93. 35	0. 9,4	12,8	13,5	9,8	17,7	12,0	10,297	-9,30	93. 35. 3,23	G.
	» S.L. M. ....	93. 35	0. 9,4	12,8	13,5	9,8	17,7	12,0			93. 35. 3,99	G.
	» S.L. M. ....	93. 35	0. 9,4	12,8	13,5	9,8	17,7	12,0	10,466	-7,45	93. 35. 5,08	G.
	» S.L. M. ....	93. 35	0. 9,4	12,8	13,5	9,8	17,7	12,0			93. 35. 4,49	G.
	» S.L. M. ....	93. 35	0. 9,4	12,8	13,5	9,8	17,7	12,0	10,939	-16,99	93. 35. 4,84	G.
	» S.L. M. ....	93. 35	0. 9,4	12,8	13,5	9,8	17,7	12,0			93. 35. 4,84	G.
	Polaris R. M....	259. 40	1. 20,4	22,9	23,3	20,4	31,8	26,4	10,784	-14,08	259. 41. 10,12	G.
	Polaris .....	7. 10	2. 49,0	50,4	54,3	46,3	60,3	51,6			7. 12. 52,00	G.
Dec. 16	Aldebaran R. M.	187. 20	4. 16,5	21,4	21,2	17,0	31,1	23,0	5,538	+1. 35,41	187. 25. 57,13	G.
	Aldebaran .....	79. 25	2. 62,0	65,0	67,0	58,4	71,8	63,9			79. 28. 4,70	G.
	⊙ S.L. M. ....	119. 10	3. 15,7	20,0	19,0	15,9	28,4	18,6	14,462	-1. 30,85	119. 11. 48,77	G.
	⊙ N.L. ....	118. 35	4. 22,3	27,5	24,0	21,8	33,1	25,0			118. 39. 25,63	G.
	η Piscium .....	81. 5	2. 46,2	51,5	52,5	47,2	62,2	52,2	10,312	-8,58	81. 7. 51,98	G.
	ο Piscium .....	87. 15	2. 42,9	48,1	50,9	43,4	57,0	48,1			87. 17. 48,42	G.
	(c) S.L. ....	80. 20	0. 54,7	57,2	61,8	53,0	68,0	57,0	10,522	-4,19	80. 20. 50,04	G.
	» S.L. M. ....	80. 20	0. 54,7	57,2	61,8	53,0	68,0	57,0			80. 20. 50,14	G.
	» S.L. M. ....	80. 20	0. 54,7	57,2	61,8	53,0	68,0	57,0	10,749	-8,62	80. 20. 50,00	G.
	» S.L. M. ....	80. 20	0. 54,7	57,2	61,8	53,0	68,0	57,0			80. 20. 49,68	G.
Dec. 17	» S.L. M. ....	80. 20	0. 54,7	57,2	61,8	53,0	68,0	57,0	10,949	-17,20	80. 20. 50,00	G.
	» S.L. M. ....	80. 20	0. 54,7	57,2	61,8	53,0	68,0	57,0			80. 20. 50,00	G.
	ν Arietis .....	74. 20	3. 3,8	6,9	11,1	0,0	19,6	6,9	14,421	-1. 29,67	74. 23. 8,07	G.
	⊙ N.L. M. ....	118. 40	3. 18,9	24,8	21,9	18,8	33,3	22,1			118. 41. 53,65	G.
	⊙ S.L. ....	119. 10	4. 11,3	18,9	16,9	12,3	25,2	15,8	12,859	-57,07	119. 14. 16,75	G.
Dec. 17	α U. Maj. SP. R. M.	288. 35	1. 22,2	25,6	26,2	23,0	31,9	26,7			288. 35. 28,86	G.
	α Ursæ Majoris SP.	338. 15	3. 28,1	31,9	33,0	26,2	42,1	33,8			338. 18. 32,53	G.

(a) At the 5th wire.  
(b) At the five wires; misty.

(c) At the five wires.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
61,34	53.17.10,70 53.17.11,37	30,076	37,2	35,2	1.20,92				91.5.39,90 91.5.40,57	$\alpha$ Aquarii R. $\alpha$ Aquarii.
61,60	-17.38.36,95 -17.38.35,75 29.28.36,72 28.26.40,17 59.44.19,32	30,218 30,200	38,6 38,0	37,6 36,6	19,22 34,21 32,78				20.8.12,11 20.8.13,31 67.16.19,21 66.14.21,23	$\beta$ Cephei R. $\beta$ Cephei. $\lambda$ Pegasi. $\mu$ Pegasi.
61,77	-24.31.24,41 -24.31.22,87		37,0	36,0	1.43,41 27,65	0,37			97.33.10,64 13.15.16,22 13.15.17,76	Uranus. $\gamma$ Cephei R. $\gamma$ Cephei.
60,85	62.27.33,57 65.56.34,22 24.27.27,73 24.27.27,42	29,210	40,3	39,0	1.51,27 2.9,75 26,50	11,65 1,27	11,425 11,610	14,28 15,67	100.16.7,19 103.45.35,31 62.15.2,51 62.15.2,20	Venus. Jupiter. $\epsilon$ Bootis R. $\epsilon$ Bootis.
61,09	-22.34.59,62 -22.34.59,45				24,23				15.11.44,43 15.11.44,60	$\beta$ Ursæ Min. R. $\beta$ Ursæ Minoris.
60,08	24.57.10,49 24.57.8,65	29,222	41,0	41,8	26,96				62.44.45,73 62.44.43,89	$\alpha$ Coron. Bor. R. $\alpha$ Coronæ Bor.
	56.52.0,36 56.52.1,56 56.52.1,64 56.52.1,45 56.52.1,99	29,190	42,0	42,2					93.36.31,35 93.36.32,55 93.36.32,63 93.36.32,44 93.36.32,98	$\delta$ . $\delta$ . $\delta$ . $\delta$ . $\delta$ .
	75.38.21,51 75.5.57,38 50.8.2,23 50.8.2,99 50.8.4,08 50.8.3,49 50.8.3,84	29,166 29,250	44,8 42,8	45,2 41,7	3.40,51 3.32,39	8,43 8,40		16.16,50	113.12.45,37 113.12.46,15 86.55.28,77 86.55.29,53	$\odot$ . $\odot$ . $\odot$ . $\delta$ .
	50.8.4,08 50.8.3,49 50.8.3,84				1.9,36	44.51,28		15.59,82	86.55.30,62 86.55.30,03 86.55.30,38	$\delta$ . $\delta$ . $\delta$ .
61,06	-36.14.9,12 -36.14.9,00	29,276	41,8	41,0	42,59				1.32.16,57 1.32.16,69	Polaris R. Polaris.
60,92	36.1.3,87 36.1.3,70	29,338	40,7	39,7	42,46				73.48.54,61 73.48.54,44	Aldebaran R. Aldebaran.
	75.44.47,77 75.12.24,63 37.40.50,98 43.50.47,42 36.53.49,04 36.53.49,14 36.53.49,00 36.53.48,68 36.53.49,00 30.56.7,07	29,678 29,910	40,4 38,8	40,3 37,0	3.48,38 3.39,96 46,24 54,90	8,43 8,41		16.16,70	113.19.19,30 113.19.21,16 75.28.45,50 81.38.50,60 73.49.25,08 73.49.25,18 73.49.25,04 73.49.24,72 73.49.25,04 68.43.51,24	$\odot$ . $\odot$ . $\eta$ Piscium. $\circ$ Piscium. $\delta$ . $\delta$ . $\delta$ . $\delta$ . $\delta$ . $\nu$ Arietis.
60,70	75.14.52,65 75.47.15,75 -65.8.27,86 -65.8.28,47	29,980 29,880	37,5 37,8	37,0 37,8	3.44,40 3.53,00 2.8,28	8,41 8,43		16.16,80	113.21.53,72 113.21.51,80 -27.23.27,86 -27.23.28,47	$\odot$ . $\odot$ . $\alpha$ U. Maj. SP. R. $\alpha$ U. Majoris SP.

Coincidence of Micrometer Wire with fixed Wire = 10',102, 10',111, 10',109, 10',115, 10',125 at the five wires.

One Micrometer Revolution = 20'',873.

Correction for Runs = + 0'',1.

Adopted Zenith Point = 43°.27'.1'',00.

Assumed Co-latitude = 37°.47'.8'',28.



Month and Day.	NAME OF STAR or PLANET.	Pointer.  ° ' "	Microscopes.						Micrometer, or Time by Molyneux.  r. h. m. s.	Correction for Microm. or Time.  " "	Concluded reading of Circle.  ° ' "	Observer.
			A	B	C	D	E	F				
			"	"	"	"	"	"				
Dec. 17	Uranus.....	103. 5	1. 59,0	66,0	64,9	61,5	72,2	63,7			103. 7. 4,55	G.
Dec. 20	(a) ) N.L.....	67. 55	0. 39,8	40,9	43,2	36,1	44,6	42,1	10,044	+ 2,00	67. 55. 43,12	G.
	) N.L. M.....	67. 55	0. 39,8	40,9	43,2	36,1	44,6	42,1		+ 1,40	67. 55. 43,52	G.
	) N.L. M.....	67. 55	0. 39,8	40,9	43,2	36,1	44,6	42,1		+ 1,00	67. 55. 43,61	G.
	) N.L. M.....	67. 55	0. 39,8	40,9	43,2	36,1	44,6	42,1		+ 2,49	67. 55. 44,44	G.
	) N.L. M.....	67. 55	0. 39,8	40,9	43,2	36,1	44,6	42,1		+ 4,32 - 1,00	67. 55. 44,27	G.
Dec. 21	(b) ☉ S.L. M.....	119. 15	4. 3,3	9,2	6,5	4,3	7,3	5,7	7,501	+ 54,56 - 0,07	119. 20. 0,56	C.
	(c) ☉ N.L.....	118. 45	2. 41,5	44,2	41,8	42,0	45,2	42,6		- 0,26	118. 47. 42,62	C.
Dec. 22	(d) Jupiter N.L.....	109. 55	1. 20,2	23,0	23,4	20,7	25,7	21,3	7,094	- 0,34	109. 56. 22,04	C.
	(e) Venus S.L. M....	108. 50	2. 40,6	42,7	45,6	39,4	46,5	42,4		+ 1. 3,58 - 1,70	108. 53. 44,76	C.
Dec. 24	☉ N.L. M.....	118. 45	0. 49,7	54,1	53,4	49,3	56,2	50,9	7,094	+ 1. 2,85	118. 46. 55,12	C.
	☉ S.L.....	119. 15	4. 17,6	22,0	20,3	16,1	23,2	19,5	13,345		119. 19. 19,80	C.
	(f) η Bootis R. M....	190. 25	2. 50,6	52,5	54,8	49,0	57,5	52,8		- 1. 7,38 - 0,21	190. 26. 45,29	C.
	(g) η Bootis.....	76. 25	2. 14,7	15,9	18,8	12,9	21,6	15,6		+ 0,95	76. 27. 17,53	C.
Dec. 27	☉ S.L.....	119. 10	4. 17,5	19,4	19,6	14,6	20,9	18,3			119. 14. 18,40	C.
	(h) ) S.L.....	104. 0	2. 59,5	61,7	63,9	58,4	64,4	60,0		- 9,87	104. 2. 51,46	C.
	(i) Jupiter S.L.....	110. 10	2. 2,1	6,0	7,6	1,8	6,6	3,1		- 0,33	110. 12. 4,20	C.
	(k) Venus S.L.....	110. 20	1. 55,5	58,6	61,6	54,8	60,3	56,6			110. 21. 57,90	C.
Dec. 28	(l) i Persei R. M....	226. 15	3. 44,7	49,2	49,1	42,6	50,6	46,8	3,880	+ 2. 10,21 - 1,09	226. 20. 56,30	C.
	i Persei.....	40. 30	2. 54,8	57,0	61,6	52,4	58,9	55,7		+ 4,85	40. 33. 1,60	C.
	(m) b Arietis R. M. ...	199. 45	3. 3,4	9,3	10,4	3,6	8,6	5,5	6,048	+ 1. 24,95 - 0,41	199. 49. 31,36	C.
	b Arietis.....	67. 0	4. 25,7	27,9	31,2	21,2	31,2	26,8		+ 1,48	67. 4. 28,83	C.
	(n) ν Persei R. M....	213. 15	1. 50,7	56,3	56,6	50,3	58,9	53,5	5,135	+ 1. 43,66 - 0,14	213. 18. 37,90	C.
	ν Persei.....	53. 35	0. 21,1	22,6	33,3	19,6	27,4	23,6		+ 0,54	53. 35. 25,14	C.
	(o) 38 Eridani R. M..	163. 55	1. 36,7	40,5	42,2	35,0	42,4	40,0	89,464	+ 3. 41,86 + 0,07	164. 0. 21,40	C.
	38 Eridani.....	102. 50	3. 36,7	41,3	42,3	35,3	40,3	37,8		- 0,02	102. 53. 38,95	C.
	(p) A.S.C. 552 R. M..	237. 15	2. 41,3	44,4	44,2	37,6	44,0	42,7	9,817	+ 5,92 - 0,34	237. 17. 47,96	C.
	A.S.C. 552.....	29. 35	1. 13,2	13,9	18,5	9,7	14,9	13,6		+ 0,34	29. 36. 14,31	C.
	(q) ) S.L. M.....	109. 30	2. 33,5	36,2	38,6	31,7	37,5	35,1	8,000	+ 43,69 + 7,40	109. 33. 26,54	C.
	) S.L. M.....	109. 30	2. 33,5	36,2	38,6	31,7	37,5	35,1	7,644	+ 51,37	109. 33. 26,82	C.
	) S.L. M.....	109. 30	2. 33,5	36,2	38,6	31,7	37,5	35,1	7,315	+ 58,49 - 7,40	109. 33. 26,54	C.
Dec. 29	(r) ) S.L. M.....	114. 25	5. 3,5	8,0	9,3	2,2	7,2	6,0	8,000	+ 43,84 + 4,45	114. 30. 54,34	C.
	) S.L. M.....	114. 25	5. 3,5	8,0	9,3	2,2	7,2	6,0	7,890	+ 46,24	114. 30. 52,29	C.
	) S.L. M.....	114. 25	5. 3,5	8,0	9,3	2,2	7,2	6,0	7,565	+ 53,27 - 6,68	114. 30. 52,64	C.
	) S.L. M.....	114. 25	5. 3,5	8,0	9,3	2,2	7,2	6,0	7,178	+ 1. 1,62 - 14,20	114. 30. 53,47	C.
	(s) Venus S.L.....	110. 55	1. 13,5	16,7	19,6	14,4	19,5	16,8			110. 56. 16,75	C.

Coincidences at the five wires taken Jan. 1, 4<sup>h</sup>. (1840).

(a) At the five wires. (b) At the 4th wire. The microscope readings not good, the microscopes not being adjusted in focus. (c) At the 5th wire. Correction for change of N.P.D. insensible. (d) 2½ intervals past middle wire. Correction for change of N.P.D. = -0",10. Microscope F was not read, but is supplied conjecturally from the next observation of Jupiter. (e) 4½ intervals past middle wire. Correction for change of N.P.D. = -0",98. Taken with micrometer wire only, the clamp failing. The Tabular Semi-diameter corrected by +0",30, is used. (f) At the 5th wire; blur. (g) 4½ intervals late. (h) At 2½ intervals past middle wire. (i) 2½ intervals late; very doubtful, seen but for an instant. Correction for change of N.P.D. = -0",09. (k) Cloudy. (l) 2½ intervals late, and just on leaving the field; unsatisfactory. (m) 2½ and 4½ intervals late. (n) At the 2nd and 5th wires. (o) At the 1st and 4th wires. (p) At the 2nd and 4th wires. (q) At the 1st, 3rd and 5th wires; good. (r) At ¾ of an interval past 1st wire, at the 3rd and 5th wires, and at 4½ intervals past middle wire; confused and unsatisfactory. (s) Steady.

Sec. of apparent Zenith Point.	Apparent Zenith Distance.	Barom.	Thermometer.		Refraction.	Parallax.	Micrometer for opposite Limb.	Semi- diameter.	Geoc. N. P. D. of Center.	NAME OF STAR or PLANET.
			Attach.	Free.						
"	"	Inch.	"	"	"	"	"	"	"	"
61,41	59.40. 3,55	29,880	37,8	57,8	1.41,77	0,37			97.28.53,23	Uranus.
	24.28.42,12	29,312	49,1	48,7					62. 7.55,59	♃.
	24.28.42,52								62. 7.55,99	♃.
	24.28.42,61				26,09	24.49,04		16.28,14	62. 7.56,08	♃.
	24.28.43,44								62. 7.56,91	♃.
	24.28.43,27								62. 7.56,74	♃.
	75.52.59,56	29,450	49,4	50,3	3.44,08	8,44			113.27.26,48	♄.
	75.20.41,62				3.35,78	8,42		16.17,00	113.27.34,26	♄.
	66.29.21,04	29,456	47,1	46,9	2.12,04	1,30	8,661	15,28	104.18.55,34	Jupiter.
	65.26.43,76				2. 5,80	10,71		11,73	103.15.35,40	Venus.
	75.19.54,12	29,152	50,6	51,5	3.32,88	8,42			113.26.44,06	♄.
	75.52.18,80				3.41,07	8,44		16.17,20	113.26.42,51	♄.
	33. 0.15,71	29,380	45,0	44,6	37,61				70.48. 1,60	η Bootis R.
	33. 0.16,53								70.48. 2,42	η Bootis.
	75.47.17,40	29,316	44,0	44,7	3.44,15	8,44		16.17,30	113.21.44,09	♄.
	60.35.50,46	29,584	37,3	35,6	1.45,09	47.32,34		14.55,44	97.22.16,05	♃.
	66.45. 3,20	29,628	36,4	34,0	2.18,15	1,32	11,400	13,35	104.34.14,96	Jupiter.
	66.54.56,90	29,644	36,3		2.19,33	10,29	11,170	11,42	104.44. 2,80	Venus.
	-2.53.55,30	29,860	36,5	34,3	3,05				34.53. 9,93	ι Persei R.
	-2.53.59,40								34.53. 5,83	ι Persei.
60,10	23.37.29,64			34,2	26,31				61.25. 4,23	♁ Arietis R.
	23.37.27,83								61.25. 2,42	♁ Arietis.
61,52	10. 8.23,10	29,876	35,3	34,5	10,76				47.55.42,14	ν Persei R.
	10. 8.24,14								47.55.43,18	ν Persei.
60,18	59.26.39,60	29,892	35,5	34,7	1.41,58				97.15.29,46	38 Eridani R.
	59.26.37,95								97.15.27,81	38 Eridani.
61,14	-13.50.46,96	29,900	35,3	34,0	14,85				23.56. 6,47	A.S.C. 552. R.
	-13.50.46,69								23.56. 6,74	A.S.C. 552.
	66. 6.25,54	30,098	34,5	33,0					102.51.29,93	♃.
	66. 6.25,82				2.16,44	49.31,80		14.48,53	102.51.30,21	♃.
	66. 6.25,54								102.51.29,93	♃.
	71. 3.53,34	30,318	33,8	30,8					107.48.13,64	♃.
	71. 3.51,29								107.48.11,59	♃.
	71. 3.51,64				2.57,64	51. 1,19		14.44,43	107.48.11,94	♃.
	71. 3.52,47								107.48.12,77	♃.
	67.29.15,75	30,314	33,1	30,4	2.27,57	10,14	11,171	11,40	105.18.30,06	Venus.

Coincidence of Micrometer Wire with fixed Wire = 10',102, 10',111, 10',109, 10',115, 10',125 at the five wires.

From Dec. 24 = 10',093, 10',101, 10',105, 10',109, 10',117. For the Moon Dec. 29 at  $4\frac{1}{4}$  intervals, 10',130.

One Micrometer Revolution = 20'',873.

Correction for Runs = + 0'',1.

Adopted Zenith Point = 43°.27'.1'',00.

Assumed Co-latitude 37°.47'.8'',28.





MEAN NORTH POLAR DISTANCES OF STARS

OBSERVED IN THE YEAR 1839,

AS DEDUCED FROM EACH DAY'S OBSERVATION,

WITHOUT CORRECTIONS FOR THE DISCORDANCE OF ZENITH POINTS,  
AND FOR THE ALTERATION OF CO-LATITUDE:

WITH

A CATALOGUE

OF THE

CONCLUDED MEAN NORTH POLAR DISTANCES,

JANUARY 1, 1839,

CORRECTED FOR THE DISCORDANCE OF ZENITH POINTS,  
AND FOR THE ALTERATION OF CO-LATITUDE.



$\alpha$ Andromedæ.	$\alpha$ Cassiopeiæ R. <i>continued.</i>	Polaris R. <i>continued.</i>	Polaris SP. R. <i>continued.</i>
Sept. 22.....61. 47. 52,67 28                   52,59	Sept. 19.....34. 20. 46,10 23                   46,69 26                   47,79 27                   48,19 30                   46,81	Apr. 29.....1. 32. 56,08 30                   54,26	June 17.... 1. 32. 59,07 19                   56,68
Oct. 7               53,71 15               53,71 19               52,76	Oct. 7               46,90 19               47,65	May 12              55,81 17              54,72	July 4               57,05 11               57,13
$\alpha$ Andromedæ R.	$\alpha$ Cassiopeiæ SP.		
Sept. 22.....61. 47. 55,38 28                   55,17	Mar. 27.....34. 20. 48,53	Sept. 19             56,24 23             55,82 26             57,61 30             56,99	Sept. 23             57,29 24             57,71 25             56,91 30             32. 58,73
Oct. 7               54,29 15               54,84 19               54,54	Apr. 25             45,99	Oct. 7               56,67 10               58,21 14               57,17 26               55,45	Oct. 3               33. 0,10 4               32. 59,34 10               56,95 11               56,15 15               56,89
$\gamma$ Pegasi.	$\alpha$ Cassiopeiæ SP. R.		
Sept. 22.....75. 42. 38,78 28                   39,46	Mar. 27.....34. 20. 45,86	Nov. 22             56,98 28             57,37	Nov. 29             57,15 30             56,86
Oct. 7               41,27	Apr. 25             49,64	Dec. 14             57,96	
$\gamma$ Pegasi R.	$\beta$ Ceti.	Polaris SP.	* R. 1 <sup>h</sup> . 17 <sup>m</sup> . 16 <sup>s</sup> . SP.
Sept. 22.....75. 42. 43,98 28                   43,19	Oct. 16.....108. 52. 15,48	Mar. 9.....1. 32. 54,43 11                   57,14	Apr. 6.....33. 28. 8,59 19                   8,50 25                   8,91
Oct. 7               42,58	$\beta$ Ceti R.	Apr. 19             56,55 25             54,62 29             56,83 30             58,32	May 3               10,26
$d$ Piscium.	Oct. 16.....108. 52. 16,87	May 21             58,20 25             54,32	* R. 1 <sup>h</sup> . 21 <sup>m</sup> . 45 <sup>s</sup> . SP.
Sept. 22.....82. 42. 14,18 23                   15,22 27                   15,29 28                   14,32	$\epsilon$ Piscium.	June 17             57,63 19             58,27	Apr. 25.....33. 38. 22,49
Nov. 16             15,89	Sept. 23.....82. 58. 40,70	July 4               57,75 11               57,31	$\eta$ Piscium.
$\alpha$ Cassiopeiæ.	Polaris.	Aug. 1              57,78	Sept. 23. ....75. 29. 9,58
Jan. 12.....34. 20. 46,90 16                   48,93	Mar. 26.....1. 32. 57,24	Sept. 23             56,30 24             57,37 25             57,43 30             55,74	Dec. 16             13,66
June 5               48,85	Apr. 29             57,10 30             56,83	Oct. 3               55,50 4               57,23 10               56,25 11               57,98 15               56,69	$\omicron$ Piscium.
Sept. 19             49,32 23             48,85 26             47,61 27             48,04 30             48,63	May 12             57,66 17             57,30	Nov. 29             56,33 30             56,03	Dec. 16.....81. 39. 16,72
Oct. 7               48,51 19               48,17	June 5               58,33		$\epsilon$ Cassiopeiæ SP.
$\alpha$ Cassiopeiæ R.	Sept. 19             57,69 23             57,61 26             58,47 30             58,28		Apr. 19.....27. 7. 34,79
Jan. 12.....34. 20. 48,20 16                   47,17	Oct. 7               58,61 10               55,80 14               59,17 26               59,94		$\epsilon$ Cassiopeiæ SP. R.
June 5               45,80	Nov. 22             58,89 28             56,46		Apr. 19.....27. 7. 34,97
	Dec. 14             58,08		$\alpha$ Arietis.
	Polaris R.		Jan. 22.....67. 18. 6,64
	Mar. 26.....1. 32. 55,20	Mar. 9.....1. 32. 58,51 11                   56,75	Oct. 11               6,00 19               6,23 26               7,33 28               6,85
		Apr. 19             57,36 25             57,60 29             55,72 30             56,89	
		May 21             56,85 25             59,88	

$\alpha$ Arietis R.	$\delta$ Arietis.	A <sup>1</sup> Tauri.	Capella.
Jan. 22.....67. 18. 7,56	Aug. 2.....70. 53. 12,77	Aug. 2.....68. 21. 49,19	Jan. 15.....44. 10. 25,87
Oct. 11 8,71	Oct. 28 12,03	Oct. 24 48,87	17 25,84
19 7,93	Nov. 20 12,93	Nov. 20 49,33	19 24,78
26 6,05		21 49,88	Feb. 14 25,37
28 6,33			16 26,33
			18 26,94
$i$ Persei.	$\alpha$ Persei.	38 Eridani.	May 7 25,61
Dec. 28.....34. 53. 43,33	Jan. 8.....40. 43. 5,05	Dec. 28.....97. 15. 43,28	8 26,09
	Oct. 24 5,23		17 26,67
	Nov. 28 5,63		28 26,92
$i$ Persei R.	$\alpha$ Persei R.	38 Eridani R.	29 26,14
Dec. 28.....34. 53. 47,43		Dec. 28.....97. 15. 44,93	30 26,94
			June 6 25,29
$\nu$ Arietis.	Jan. 8.....40. 43. 2,87		11 25,58
Dec. 16.....68. 44. 19,30	Oct. 24 6,24	$\nu^1$ Tauri.	16 25,78
	Nov. 28 4,03	Nov. 20.....67. 33. 27,68	17 25,21
		21 29,17	19 25,69
$\gamma$ Ceti.	F Eridani.	Aldebaran.	20 26,74
Oct. 28.....87. 26. 47,18	Nov. 18.....108. 0. 15,09	Aug. 4.....73. 49. 13,50	July 5 25,21
		15 13,00	Aug. 15 25,84
$\gamma$ Ceti R.	$\nu$ Persei.	Nov. 18 13,66	31 27,72
Oct. 28.....87. 26. 46,00	Dec. 28.....47. 56. 11,48	22 11,63	Nov. 22 26,91
		Dec. 14 12,94	
$b$ Arietis.	$\nu$ Persei R.	Aldebaran R.	Capella R.
Dec. 28.....61. 25. 32,05	Dec. 28.....47. 56. 10,44	Aug. 4.....73. 49. 12,08	Jan. 15.....44. 10. 26,02
		15 14,10	17 25,83
$b$ Arietis R.	$\eta$ Tauri.	Nov. 18 14,41	19 26,92
Dec. 28.....61. 25. 33,86	Aug. 2.....66. 23. 53,10	22 16,17	Feb. 14 26,82
	Oct. 24 52,92	Dec. 14 13,11	16 25,73
$\pi$ Arietis.	Nov. 18 52,55		18 25,10
Jan. 22.....73. 12. 33,83	26 53,74	A.S.C. 552.	May 7 27,17
Oct. 28 34,80		Dec. 28.....23. 56. 30,17	8 27,42
$\epsilon$ Arietis.	$\eta$ Tauri R.	A.S.C. 552. R.	17 28,18
Jan. 22.....69. 18. 28,71	Aug. 2.....66. 23. 54,35	Dec. 28.....23. 56. 29,90	28 27,15
Oct. 28 30,25	Oct. 24 54,83		29 26,66
Nov. 20 28,00	Nov. 18 54,03	A.S.C. 552. SP.	30 26,55
	26 53,03	May 17.....23. 56. 28,82	June 6 25,71
$\alpha$ Ceti.	$\gamma^1$ Eridani.	27 28,99	11 27,47
Jan. 22.....86. 32. 46,15	Oct. 24.....103. 58. 13,39	A.S.C. 552. SP. R.	16 27,97
Oct. 28 46,10		May 17.....23. 56. 31,17	17 25,81
		27 31,31	19 26,51
$\alpha$ Ceti R.	$\gamma^1$ Eridani R.	$\beta$ Tauri.	20 26,79
Jan. 22.....86. 32. 45,21	Oct. 24.....103. 58. 16,74	Jan. 15.....61. 32. 7,09	July 5 27,07
Oct. 28 44,98		19 6,23	Aug. 15 26,86
		Feb. 18 8,35	31 26,22
		May 29 6,37	Nov. 22 26,72
		Aug. 31 7,91	



$\beta$ Tauri <i>continued.</i>	$\alpha$ Orionis R.	Pollux <i>continued.</i>	Regulus <i>continued.</i>
Nov. 22..... $61^{\circ} 32' 7.43''$	Aug. 4..... $82^{\circ} 37' 46.17''$	Apr. 26..... $61^{\circ} 35' 27.24''$	Apr. 29..... $77^{\circ} 14' 54.21''$
$\beta$ Tauri R.	$\alpha$ Lyncis SP.	Sept. 29 26,89	Sept. 29 55,25
Jan. 15..... $61^{\circ} 32' 7.74''$ 19 8,90	July 5..... $28^{\circ} 26' 35.80''$	Pollux R.	Regulus R.
Feb. 18 6,74	$\alpha$ Lyncis SP. R.	Feb. 23..... $61^{\circ} 35' 29.90''$	Feb. 25..... $77^{\circ} 14' 57.03''$
May 29 8,73	July 5..... $28^{\circ} 26' 36.44''$	Apr. 26 28,47	Apr. 29 55,78
Aug. 31 7,39	$\iota$ Geminorum.	Sept. 29 28,69	Sept. 29 55,70
Nov. 22 9,07	Feb. 23..... $61^{\circ} 53' 16.59''$	55 Camelopardi SP.	$\rho$ Leonis.
$\delta$ Orionis.	Sept. 29 18,12	Aug. 7..... $21^{\circ} 3' 42.62''$	Mar. 27..... $79^{\circ} 52' 0.11''$
Jan. 15..... $90^{\circ} 25' 27.57''$ 17 27,38 19 26,97	Castor.	Oct. 16 43,85	Apr. 22 1,04
Feb. 18 26,31	Feb. 23..... $57^{\circ} 45' 53.18''$	55 Camelopardi SP. R.	$\iota$ Leonis.
$\delta$ Orionis R.	Apr. 19 54,81 24 56,29 26 55,91	Aug. 7..... $21^{\circ} 3' 43.53''$	Feb. 27..... $78^{\circ} 36' 15.52''$
Jan. 15..... $90^{\circ} 25' 26.46''$ 17 26,12 19 27,23	Sept. 29 54,47	Oct. 16 42,69	Mar. 27 14,92
Feb. 18 26,59	Castor R.	$\lambda$ Leonis.	* (Z) R. $10^h.44^m.38^s$ .
$\epsilon$ Orionis.	Feb. 23..... $57^{\circ} 45' 56.82''$	Feb. 25..... $66^{\circ} 19' 31.45''$	Mar. 27..... $26^{\circ} 11' 42.33''$
Jan. 17..... $91^{\circ} 18' 38.83''$	Apr. 19 56,64 24 55,24 26 56,54	* (o) R. $9^h.22^m.40^s$ .	Apr. 6 43,19
$\epsilon$ Orionis R.	Sept. 29 55,81	Apr. 21..... $69^{\circ} 17' 7.37''$ 24 6,26	* R. $10^h.52^m.24^s$ .
Jan. 17..... $91^{\circ} 18' 38.07''$	Procyon.	14 Leonis.	Apr. 25..... $26^{\circ} 0' 50.54''$ 29 52,11
$\iota$ Aurigæ.	Apr. 19..... $84^{\circ} 22' 1.91''$ 24 3,01 26 2,17	Feb. 25..... $79^{\circ} 22' 41.68''$	$\alpha$ Ursæ Majoris.
Nov. 22..... $59^{\circ} 36' 37.07''$	Aug. 4 2,47	$\nu$ Ursæ Majoris SP.	Feb. 25..... $27^{\circ} 22' 53.44''$ 27 53,44
$\alpha$ Columbæ.	Sept. 29 1,17	$\nu$ Ursæ Majoris SP. R.	Mar. 6 54,64 9 54,23 25 53,72 27 52,27
Nov. 22..... $124^{\circ} 9' 50.30''$	Procyon R.	Sept. 21..... $30^{\circ} 12' 31.18''$	Apr. 6 55,15
C Tauri.	Apr. 19..... $84^{\circ} 22' 2.93''$ 24 1,70 26 2,96	$\nu$ Leonis.	June 6 53,07 20 53,34
Aug. 31..... $62^{\circ} 25' 58.36''$	Aug. 4 5,19	Mar. 25..... $76^{\circ} 47' 25.11''$	Sept. 19 54,04 29 54,48 30 53,67
Nov. 22 57,58	Sept. 29 2,87	$\eta$ Leonis.	Oct. 2 53,81 13 52,89 15 53,10
$\alpha$ Orionis.	Pollux.	Mar. 25..... $72^{\circ} 27' 17.52''$	$\alpha$ Ursæ Majoris R.
Aug. 4..... $82^{\circ} 37' 45.22''$	Feb. 23..... $61^{\circ} 35' 25.95''$	Regulus.	Feb. 25..... $27^{\circ} 22' 52.64''$ 27 53,66
		Feb. 25..... $77^{\circ} 14' 53.52''$	

<i>α Ursæ Majoris R. continued.</i>	<i>τ Leonis.</i>	<i>γ Ursæ Majoris R. continued.</i>	<i>κ Draconis SP.</i>
Mar. 6.....27.22.51,42 9 51,56 25 52,84 27 53,69	Apr. 24.....86.15.29,07 25 28,28	Apr. 6.....35.24.34,03 25 36,49	Sept. 23.....19.19.23,29
Apr. 6 51,76	<i>υ Leonis.</i>	May 2 34,27 21 35,18 27 35,29	Oct. 14 23,99 16 23,66
June 6 51,63 20 53,23	Mar. 27.....89.56.5,92	<i>γ Ursæ Majoris SP.</i>	<i>κ Draconis SP. R.</i>
Sept. 19 51,48 29 52,79 30 53,60	May 21 7,36	Sept. 28.....35.24.35,69	Sept. 23.....19.19.24,14
Oct. 2 54,72 13 52,90 15 53,00	* (p) <i>℞</i> . 11 <sup>h</sup> .39 <sup>m</sup> .23 <sup>s</sup> .	Oct. 19 34,69	Oct. 14 23,62 16 25,43
	Mar. 9.....83.12.54,61	Nov. 16 36,52	<i>γ<sup>1</sup> Virginis.</i>
	<i>β Leonis.</i>	<i>γ Ursæ Majoris SP. R.</i>	Apr. 25.....90.33.54,59
<i>α Ursæ Majoris SP.</i>	Feb. 26.....74.31.39,70	Sept. 28.....35.24.34,12	<i>ψ Virginis.</i>
Sept. 6.....27.22.52,57 18 53,31 21 53,17 28 53,55 30 53,57	Mar. 11 39,80	Oct. 19 34,81	Apr. 25.....98.39.45,49
Oct. 15 52,13	May 21 41,00 27 41,25	Nov. 16 34,97	<i>42 Virginis?</i> * <i>℞</i> . 12 <sup>h</sup> .47 <sup>m</sup> .7 <sup>s</sup> .
Nov. 16 55,21	<i>β Leonis R.</i>	* (e) <i>℞</i> . 11 <sup>h</sup> .50 <sup>m</sup> .17 <sup>s</sup> .	Apr. 6.....81.17.16,74 25 14,56 29 15,08
Dec. 17 52,98	Feb. 26.....74.31.42,98	Feb. 26.....84.45.36,59	May 3 15,54
	Mar. 11 41,75	Mar. 9 37,91 11 39,56	<i>Spica.</i>
<i>α Ursæ Majoris SP. R.</i>	May 21 40,98 27 40,58	<i>ο Virginis.</i>	May 20...100.19.7,28 28 5,98
Sept. 6.....27.22.52,38 18 54,13 21 53,25 28 53,28 30 53,58	<i>β Virginis.</i>	Apr. 24.....80.22.22,11 25 21,66	June 19 6,78
Oct. 15 52,72	Apr. 24.....87.19.39,37 25 40,88	* (f) <i>℞</i> . 11 <sup>h</sup> .59 <sup>m</sup> .20 <sup>s</sup> .	July 4 7,15
Nov. 16 51,81	<i>γ Ursæ Majoris.</i>	Feb. 27.....84.35.22,82	Nov. 22 6,12
Dec. 17 52,37	Feb. 23.....35.24.35,62 26 36,21	Mar. 9 22,37 11 23,75	<i>Spica R.</i>
<i>χ Leonis.</i>	Mar. 9 35,80 11 35,69 13 35,86 27 35,52	* (c) <i>℞</i> . 12 <sup>h</sup> .3 <sup>m</sup> .28 <sup>s</sup> .	May 20...100.19.7,65 28 5,89
Feb. 27.....81.47.41,52 28 40,67	Apr. 6 38,10 25 37,46	Feb. 23.....85.2.53,91	June 19 6,87
Apr. 24 43,25 25 42,34	May 2 36,58 21 36,40 27 35,65	Mar. 9 52,36 11 53,62	July 4 8,16
<i>σ Leonis.</i>	<i>γ Ursæ Majoris R.</i>	<i>δ Ursæ Majoris SP.</i>	Nov. 22 6,80
Mar. 27.....83.5.21,32	Feb. 23.....35.24.37,40 26 35,02	Oct. 14.....32.4.19,73 19 18,24	<i>α Virginis.</i>
* <i>℞</i> . 11 <sup>h</sup> .16 <sup>m</sup> .48 <sup>s</sup> .	Mar. 9 36,83 11 37,80 13 36,93 27 37,16	<i>δ Ursæ Majoris SP. R.</i>	May 25...107.19.45,46
Mar. 27.....26.58.7,71		Oct. 14.....32.4.19,13 19 21,05	<i>η Ursæ Majoris.</i>
Apr. 6 10,00			Apr. 17.....39.52.51,29 25 52,48 30 48,49



$\eta$ Ursæ Majoris continued.	Arcturus R.	$\beta$ Ursæ Minoris R.	$\alpha$ Coronæ Borealis.
May 3..... $39^{\circ} 52' 50''$ 7 52,06 28 50,83	Apr. 17..... $69^{\circ} 58' 36''$ 27 34,99 28 33,55	Apr. 27..... $15^{\circ} 11' 10''$ 28 12,51 29 12,20 30 13,82	Apr. 30..... $62^{\circ} 44' 20''$ June 1 21,84 Aug. 2 18,64 Nov. 4 20,13 6 21,84 Dec. 12 21,12
June 19 51,22	July 5 33,53	May 1 12,53 7 9,89	
$\eta$ Ursæ Majoris R.	Aug. 1 34,92	Aug. 1 10,02 Dec. 12 11,59	$\alpha$ Coronæ Borealis R.
Apr. 17..... $39^{\circ} 52' 50''$ 25 48,72 30 51,82	Oct. 3 35,09 11 35,82 17 38,43 26 35,39	$\beta$ Ursæ Minoris SP.	Apr. 30..... $62^{\circ} 44' 21''$ June 1 21,17 Aug. 2 22,76 Nov. 4 21,78 6 20,38 Dec. 12 22,96
May 3 52,25 7 50,04 28 50,86	Nov. 19 33,76 Dec. 3 34,23	Jan. 24..... $15^{\circ} 11' 13''$ Nov. 26 10,14 28 11,97	$\chi$ Libræ.
June 19 53,20	$\lambda$ Virginis.	$\beta$ Ursæ Minoris SP. R.	Apr. 29... $113^{\circ} 17' 17''$ 30 13,20 May 26 21,80
$\eta$ Bootis.	Apr. 27... $102^{\circ} 37' 32''$ 28 32,66	Jan. 24..... $15^{\circ} 11' 10''$ Nov. 26 11,39 28 12,07	$\alpha$ Serpentis.
Apr. 25..... $70^{\circ} 47' 33''$ 27 31,37	A.S.C. 1668.	A.S.C. 1703.	May 3..... $83^{\circ} 3' 48''$ 26 47,40 June 1 47,15
May 3 32,28 7 32,42 28 31,65	Apr. 27... $110^{\circ} 29' 17''$ 28 18,06	Apr. 27..... $97^{\circ} 12' 19''$ May 3 3,56	$\alpha$ Serpentis R.
June 19 32,46	May 3 18,56	20 Libræ.	May 3..... $83^{\circ} 3' 46''$ 26 45,53 June 1 46,18
Dec. 24 32,66	$\rho$ Libræ.	Apr. 28... $114^{\circ} 38' 33''$ 29 38,29	$b$ Scorpii.
$\eta$ Bootis R.	Apr. 27... $104^{\circ} 46' 34''$ 28 34,09	May 3 35,75	May 26... $115^{\circ} 15' 19''$
Apr. 25..... $70^{\circ} 47' 31''$ 27 32,03	May 3 35,62	$\sigma^1$ Libræ.	4 Scorpii.
May 3 32,84 7 31,36 28 34,18	$\epsilon$ Bootis.	Apr. 29... $104^{\circ} 57' 44''$ May 3 46,45	Apr. 29... $115^{\circ} 47' 6''$ May 3 5,42
June 19 31,97	May 1..... $62^{\circ} 14' 35''$ Aug. 2 33,45 Dec. 12 35,60	$\ast$ $\mathcal{R}$ . $15^h. 8^m. 38^s$ .	$\zeta$ Ursæ Minoris.
Dec. 24 31,84	Dec. 12 35,60	Apr. 29..... $97^{\circ} 15' 35''$ May 3 35,75	May 3..... $11^{\circ} 42' 50''$ 21 50,67 June 1 50,88
Arcturus.	$\epsilon$ Bootis R.	$\ast$ $\mathcal{R}$ . $15^h. 20^m. 30^s$ .	
Apr. 17..... $69^{\circ} 58' 34''$ 27 33,08 28 33,46	May 1..... $62^{\circ} 14' 37''$ Aug. 2 37,20 Dec. 12 35,91	Apr. 29... $106^{\circ} 52' 47''$ May 3 47,50 28 45,40	
July 5 32,75	$\beta$ Ursæ Minoris.	A.S.C. 1752.	
Aug. 1 32,41	Apr. 27..... $15^{\circ} 11' 12''$ 28 11,71 29 10,71 30 11,30	May 28... $106^{\circ} 41' 40''$	
Oct. 3 33,65 11 32,74 17 34,68 26 32,74	May 1 10,89 7 14,32		
Nov. 19 33,44	Aug. 1 10,90		
Dec. 3 33,38	Dec. 12 11,76		

ζ Ursæ Minoris R.	ε Ophiuchi.	α Herculis.	A.S.C. 2044.
May 3.....11. 42. 49,02 21 48,68	May 17.....79. 33. 50,55 25 51,88	May 27.....65. 20. 6,20	July 5...120. 31. 59,01
June 1 47,18	June 1 51,75 4 50,95	June 15 7,31 19 7,13	* R. 17 <sup>h</sup> . 46 <sup>m</sup> . 8 <sup>s</sup> .
ζ Ursæ Minoris SP.	ε Ursæ Minoris.	33 Scorpii.	July 16.....48. 11. 41,89
Jan. 14.....11. 42. 50,72	May 14.....7. 42. 35,17	May 17...114. 5. 20,35	* R. 17 <sup>h</sup> . 46 <sup>m</sup> . 31 <sup>s</sup> .
Nov. 26 45,88	17 33,51	27 17,97	July 5.....48. 15. 52,13
ζ Ursæ Minoris SP. R.	25 35,10	June 19 17,73	θ Herculis.
Jan. 14.....11. 42. 46,94	27 34,58	ρ Herculis.	July 5.....52. 43. 25,40
Nov. 26 50,66	June 4 32,73	May 27.....52. 42. 5,68	16 26,02
δ Scorpii.	July 16 33,04	June 15 8,04	γ Draconis.
Apr. 29...112. 9. 25,69	ε Ursæ Minoris R.	19 6,04	July 5.....38. 29. 21,40
30 24,40	May 14.....7. 42. 33,04	* R. 17 <sup>h</sup> . 18 <sup>m</sup> . 41 <sup>s</sup> .	16 21,45
η Draconis.	17 33,03	May 17.....57. 10. 50,32	Sept. 9 21,32
Aug. 8.....28. 7. 10,80	25 30,76	June 15 52,11	* R. 18 <sup>h</sup> . 0 <sup>m</sup> . 30 <sup>s</sup> .
η Draconis R.	27 30,78	July 5 50,51	July 3.....44. 18. 27,29
Aug. 8.....28. 7. 11,09	June 4 33,08	* R. 17 <sup>h</sup> . 26 <sup>m</sup> . 7 <sup>s</sup> .	5 27,74
η Draconis SP.	July 16 34,52	May 17.....55. 3. 27,46	16 27,33
Jan. 14.....28. 7. 12,14	* R. 17 <sup>h</sup> . 4 <sup>m</sup> . 40 <sup>s</sup> .	June 15 27,72	δ Ursæ Minoris.
η Draconis SP. R.	May 29.....89. 26. 46,27	19 29,06	June 22.....3. 24. 33,41
Jan. 14.....28. 7. 10,82	June 15 45,26	α Ophiuchi.	July 3 32,17
α Herculis.	19 46,03	Aug. 17.....77. 19. 2,48	5 33,09
May 14.....75. 25. 13,69	α Herculis R.	28 1,04	Sept. 9 31,46
25 16,53	May 14.....75. 25. 15,46	Oct. 16 0,45	13 32,50
July 5 13,46	25 18,59	Nov. 20 2,17	26 31,37
α Herculis.	July 5 16,69	α Ophiuchi R.	δ Ursæ Minoris R.
May 14.....84. 7. 48,81	A.S.C. 1972.	Aug. 17.....77. 19. 2,31	June 22.....3. 24. 31,55
17 47,83	May 17...122. 22. 10,15	28 2,34	July 3 31,82
25 50,57	27 14,24	Oct. 16 2,36	5 32,34
* R. 16 <sup>h</sup> . 30 <sup>m</sup> . 15 <sup>s</sup> .	June 19 8,71	Nov. 20 3,91	Sept. 9 33,13
May 25.....80. 11. 25,79	* R. 17 <sup>h</sup> . 12 <sup>m</sup> . 30 <sup>s</sup> .	79 Herculis.	13 32,92
27 26,14	May 17.....61. 0. 16,81	May 17.....65. 35. 21,85	26 32,77
June 4 25,88	June 15 15,53	June 15 22,25	δ Ursæ Minoris SP.
i Herculis.	19 14,18	19 21,27	Jan. 19. ....3. 24. 32,43
May 25.....81. 7. 7,55	A.S.C. 2042.	July 5...121. 38. 20,73	Feb. 27 32,79
29 7,16	May 17.....61. 0. 16,81		δ Ursæ Minoris SP. R.
June 1 7,42	June 15 15,53		Jan. 19.....3. 24. 32,89
	19 14,18		Feb. 27 32,91



* $\mathcal{R}$ . $18^h.27^m.20^s$ .	$\beta$ Lyræ <i>continued</i> .	$\delta$ Draconis SP. R.	$\sigma$ Capricorni.
July 3...107.19.53,13 5 53,96 16 56,64	Aug. 23.....56.49.10,91 Sept. 25 9,99 26 10,45	Feb. 27.....22.37.17,34	Oct. 15...109.36.54,00 16 54,45
* $\mathcal{R}$ . $18^h.30^m.8^s$ .	$\beta$ Lyræ R.	O Sagittarii.	$\pi$ Capricorni.
Sept. 9.....38.23.27,96	July 3.....56.49.13,39 5 12,85 16 11,34	July 3...120.3.13,76 16 11,18	Sept. 19...108.44.2,19
* $\mathcal{R}$ . $18^h.30^m.47^s$ .	Aug. 23 11,80	Aug. 23 12,90	Oct. 15 0,40 16 1,14
July 3.....38.20.35,91 5 36,93	Sept. 25 12,86 26 13,24	$\gamma$ Aquilæ.	$\lambda$ Ursæ Minoris.
$\alpha$ Lyræ.	$\beta$ Lyræ's Companion.	Aug. 21.....79.46.26,54	July 15.....1.10.28,70
Jan. 7.....51.21.44,29 8 44,40 9 43,55 15 44,16	July 5.....56.49.50,33 Aug. 23 50,64	Oct. 29 27,89 30 27,34	Aug. 5 27,26
June 22 44,06	$\beta$ Lyræ's Companion R.	$\gamma$ Aquilæ R.	Sept. 19 26,78 25 26,40
July 16 42,64	July 5.....56.49.51,12 Aug. 23 52,59	Aug. 21.....79.46.26,21	Oct. 15 28,70
Aug. 3 43,37 8 43,51 10 43,22 17 43,84 23 42,78	* $\mathcal{R}$ . $18^h.48^m.20^s$ .	Oct. 29 25,32 30 25,87	Nov. 16 26,49 22 26,20
Sept. 13 43,19 26 42,03	July 3.....87.43.52,05 5 52,38 16 51,82	$\alpha$ Aquilæ.	$\lambda$ Ursæ Minoris R.
Oct. 30 43,98	S Sagittarii.	Oct. 15.....81.33.4,89 16 5,60 29 6,82 30 6,96	July 15.....1.10.24,76
Nov. 26 43,59	July 3...121.16.26,82 5 27,32 16 29,71	Nov. 4 5,05	Aug. 5 25,46
$\alpha$ Lyræ R.	A.S.C. 2212.	$\alpha$ Aquilæ R.	Sept. 19 26,30 25 26,88
Jan. 7.....51.21.44,12 8 43,29 9 43,23 15 43,86	July 3...118.52.36,20 5 38,50 16 36,93	Oct. 15.....81.33.7,00 16 6,63 29 5,22 30 5,11	Oct. 15 26,64
June 22 42,42	Aug. 23 38,17	Nov. 4 5,76	Nov. 16 26,76 22 25,63
July 16 43,36	$\delta$ Draconis.	$\beta$ Aquilæ.	* $\mathcal{R}$ . $20^h.24^m.9^s$ .
Aug. 3 44,50 8 43,34 10 44,83 17 42,95 23 45,72	Oct. 15.....22.37.18,50	Oct. 15.....83.59.24,15 16 24,31	Aug. 10.....26.37.57,54
Sept. 13 43,72 26 44,20	$\delta$ Draconis R.	Nov. 4 25,41	Sept. 9 (38.4,93) 21 37.58,90
Oct. 30 43,34	Oct. 15.....22.37.16,28	$\beta$ Aquilæ R.	$\theta$ Cephei.
Nov. 26 42,43	$\delta$ Draconis SP.	Oct. 15.....83.59.25,22 16 24,79	July 15.....27.32.46,60
$\beta$ Lyræ.	Feb. 27.....22.37.19,07	Nov. 4 23,21	Sept. 9 43,98 21 44,79
July 3.....56.49.11,10 5 11,37 16 10,84	$\delta$ Draconis SP. R.	c Sagittarii.	$\alpha$ Cygni.
		Aug. 21...118.8.59,29	Jan. 24.....45.17.30,54
		Oct. 15 9.0,35 16 1,43	Feb. 12 31,29 14 31,02
			July 15 31,82
			Aug. 22 29,99
			Sept. 9 29,58

<i>α Cygni continued.</i>	<i>ς Capricorni continued.</i>	<i>β Aquarii.</i>	<i>α Aquarii continued.</i>
Sept. 19.....45 . 17 . 29,95 21 30,59	Oct. 16...105 . 50 . 9,35 29 9,68	Aug. 12.....96 . 16 . 30,37	Nov. 12.....91 . 5 . 55,97 22 57,64
Oct. 29 30,50	* <i>R.</i> 21 <sup>h</sup> . 9 <sup>m</sup> . 15 <sup>s</sup> .	<i>β Aquarii R.</i>	Dec. 5 55,30
Nov. 13 31,11 16 29,50 22 29,08 23 30,08 26 29,60	July 15.....76 . 42 . 57,20 18 58,14 Aug. 22 56,07	Aug. 12.....96 . 16 . 32,69	<i>ι Aquarii.</i>
<i>α Cygni R.</i>	<i>α Cephei.</i>	<i>β Cephei.</i>	Aug. 23...104 . 38 . 40,89 Oct. 29 50,98 30 50,91
Jan. 24.....45 . 17 . 31,47	Jan. 24.....28 . 5 . 40,97	Aug. 10 43,61	<i>θ Aquarii.</i>
Feb. 12 31,11 14 29,42	Feb. 27 40,74	Sept. 4 41,58 9 42,08 21 42,19	Sept. 21.....98 . 34 . 54,44
July 15 29,88	Mar. 8 41,62	Nov. 26 44,33	Oct. 29 56,15
Aug. 22 31,22	July 15 42,34 18 41,92	Dec. 7 42,40	Nov. 12 55,91
Sept. 9 30,92 19 31,50 21 30,01	Aug. 22 41,11	<i>β Cephei R.</i>	<i>σ Aquarii.</i>
Oct. 29 29,23	Sept. 4 41,91 9 40,53 21 42,00	July 18.....20 . 8 . 42,34	Sept. 21...101 . 29 . 56,24 28 55,51
Nov. 13 30,50 16 30,68 22 31,77 23 30,17 26 29,72	Oct. 1 38,54 29 41,40 30 41,52	Aug. 10 42,88	Nov. 12 57,82
<i>η Capricorni.</i>	<i>α Cephei R.</i>	Sept. 4 41,86 9 42,65 21 41,94	* <i>R.</i> 22 <sup>h</sup> . 35 <sup>m</sup> . 24 <sup>s</sup> .
Aug. 22...110 . 29 . 10,61	Jan. 24.....28 . 5 . 41,26	Nov. 26 42,53	Aug. 27.....24 . 20 . 1,90
Oct. 16 10,94 29 12,84	Feb. 27 41,20	Dec. 7 41,20	Sept. 6 1,89
* <i>R.</i> 21 <sup>h</sup> . 1 <sup>m</sup> . 50 <sup>s</sup> .	Mar. 8 41,09	<i>β Cephei SP.</i>	* <i>R.</i> 22 <sup>h</sup> . 35 <sup>m</sup> . 55 <sup>s</sup> .
July 15.....60 . 26 . 30,46	July 15 40,91 18 40,37	Apr. 29.....20 . 8 . 44,84	Aug. 27.....24 . 17 . 13,49
Aug. 1 27,43 22 27,42	Aug. 22 42,19	<i>β Cephei SP. R.</i>	<i>λ Pegasi.</i>
* <i>R.</i> 21 <sup>h</sup> . 2 <sup>m</sup> . 22 <sup>s</sup> .	Sept. 4 39,89 9 40,48 21 39,70	Apr. 29.....20 . 8 . 42,58	Sept. 28.....67 . 16 . 44,83 30 45,80
July 15.....25 . 0 . 6,29 18 6,96	Oct. 1 41,54 29 39,46 30 41,96	<i>δ Capricorni.</i>	Oct. 15 45,83 29 43,63 30 46,91
* <i>R.</i> 21 <sup>h</sup> . 2 <sup>m</sup> . 39 <sup>s</sup> .	<i>α Cephei SP.</i>	Aug. 23...106 . 51 . 13,56	Nov. 4 46,53 12 46,42 16 45,95 22 45,66 23 45,72 26 45,50
July 15.....25 . 2 . 1,20 18 0,49	Mar. 13.....28 . 5 . 42,33	<i>α Aquarii.</i>	Dec. 7 45,35
Aug. 10 0,64	<i>α Cephei SP. R.</i>	Aug. 12.....91 . 5 . 53,20 21 56,28	<i>μ Pegasi.</i>
<i>ς Capricorni.</i>	Mar. 13.....28 . 5 . 40,25	Nov. 12 56,50 22 55,68	Sept. 28.....66 . 14 . 46,47 30 47,64
Aug. 22...105 . 50 . 9,07	* <i>R.</i> 21 <sup>h</sup> . 20 <sup>m</sup> . 3 <sup>s</sup> .	Dec. 5 55,97	Oct. 15 47,75 29 48,44 30 47,81
	Sept. 9.....75 . 23 . 24,95 21 27,45	<i>α Aquarii R.</i>	
		Aug. 12.....91 . 5 . 58,07 21 58,72	



$\mu$ Pegasi <i>continued.</i>	$\alpha$ Pegasi <i>continued.</i>	$\gamma$ Cephei <i>continued.</i>	$\omega$ Piscium.
Nov. 4..... <sup>0</sup> 66 . 14' . 48,45"	Sept. 4..... <sup>0</sup> 75 . 39' . 34,60"	Sept. 18..... <sup>0</sup> 13 . 15' . 58,28"	Sept. 22..... <sup>0</sup> 84 . 1' . 38,02"
12.....47,94	12.....33,53	19.....57,89	28.....38,61
16.....47,74	19.....34,89	22.....57,37	Oct. 7.....39,80
22.....45,46	Oct. 7.....33,54	28.....57,96	Nov. 16.....39,48
23.....47,60		Nov. 12.....56,17	
26.....47,91		16.....56,50	
Dec. 7.....47,93	$\alpha$ Pegasi R.	Dec. 7.....57,34	$q$ Piscium.
$\iota$ Cephei.	Aug. 24.....75 . 39' . 34,60"		Oct. 19.....93 . 55' . 23,62"
	27.....34,95	$\gamma$ Cephei R.	
Aug. 27.....24 . 38' . 43,59	Sept. 4.....34,08	Aug. 27.....13 . 15' . 57,15"	* $R$ . 23 <sup>h</sup> . 53 <sup>m</sup> . 39 <sup>s</sup> .
Sept. 6.....43,17	12.....34,46	29.....55,92	Sept. 19.....25 . 26' . 36,81
28.....43,02	19.....33,94	Sept. 18.....57,51	
	Oct. 7.....36,32	19.....57,36	* $R$ . 23 <sup>h</sup> . 54 <sup>m</sup> . 16 <sup>s</sup> .
$\iota$ Cephei SP.	$\phi$ Aquarii.	22.....55,37	Sept. 19.....26 . 21' . 29,64
Apr. 29.....24 . 38' . 42,89	Sept. 21.....96 . 54' . 55,85	28.....55,95	21.....30,17
$\iota$ Cephei SP. R.	22.....54,42	Nov. 12.....56,67	22.....27,60
Apr. 29.....24 . 38' . 42,43	$\kappa^1$ Piscium.	16.....57,18	
$\lambda$ Aquarii.	Sept. 21.....89 . 37' . 28,31	Dec. 7.....55,80	* $R$ . 23 <sup>h</sup> . 56 <sup>m</sup> . 54 <sup>s</sup> .
	22.....27,62	$\lambda$ Piscium.	Sept. 19.....26 . 6' . 56,03
Aug. 24.....98 . 26' . 3,49	Nov. 16.....28,48	Oct. 19.....89 . 6' . 18,06	21.....56,10
25.....1,86		$\delta$ Ap. Sculp.	
$\alpha$ Pegasi.	$\gamma$ Cephei.	Sept. 21...119 . 1' . 9,64	* $R$ . 23 <sup>h</sup> . 58 <sup>m</sup> . 7 <sup>s</sup> .
Aug. 24.....75 . 39' . 32,68	Aug. 27.....13 . 15' . 58,71	Oct. 7.....10,17	Sept. 19.....26 . 42' . 0,11
27.....33,21	29.....58,53		21.....2,01

CATALOGUE of the CONCLUDED MEAN NORTH POLAR DISTANCES, JAN. 1, 1839;  
with the ANNUAL VARIATIONS.

(The N.P.D. have been corrected for the Discordance of Zenith Points, and for the Error of the Assumed  
Co-latitude, in the manner explained in the Introduction.)

Name of Star.	Number of Obser- vations.	Mean N.P.D. Jan. 1, 1839.	Annual Variation.	Name of Star.	Number of Obser- vations.	Mean N.P.D. Jan. 1, 1839.	Annual Variation.
$\alpha$ Andromedæ.....	5	61. 47. 53.82	- 20.056	C Tauri.....	2	62. 25. 58.70	- 1.469
$\alpha$ Andromedæ R.....	5	54.29		$\alpha$ Orionis.....	1	82. 37. 45.40	- 1.182
$\gamma$ Pegasi.....	3	75. 42. 40.36	- 20.051	$\alpha$ Orionis R.....	1	46.17	
$\gamma$ Pegasi R.....	3	42.91		$\alpha$ Lyncis SP.....	1	23. 26. 35.69	+ 0.268
$d$ Piscium.....	5	82. 42. 15.16	- 20.027	$\alpha$ Lyncis SP. R.....	1	36.37	
$\alpha$ Cassiopeiæ.....	10	34. 20. 48.26	- 19.867	$\iota$ Geminorum.....	2	61. 53. 18.09	+ 6.502
$\alpha$ Cassiopeiæ R.....	10	47.43		Castor.....	5	57. 45. 55.60	+ 7.216
$\alpha$ Cassiopeiæ SP.....	2	47.19		Castor R.....	5	55.72	
$\alpha$ Cassiopeiæ SP. R.....	2	47.64		Procyon.....	5	84. 22. 2.31	+ 8.728
$\beta$ Ceti.....	1	108. 52. 16.06	- 19.815	Procyon R.....	5	3.15	
$\beta$ Ceti R.....	1	16.47		Pollux.....	3	61. 35. 27.42	+ 8.117
$\epsilon$ Piscium.....	1	82. 58. 40.88	- 19.491	Pollux R.....	3	28.47	
Polaris.....	17	1. 32. 57.44	- 19.326	55 Camelopardi SP..	2	21. 3. 43.14	+ 9.774
Polaris R.....	17	56.99		55 Camelop. SP. R..	2	43.03	
Polaris SP.....	24	57.12		$\lambda$ Leonis.....	1	66. 19. 32.21	+ 15.505
Polaris SP. R.....	24	57.04		* ( $\phi$ ) $\mathcal{R}$ . 9 <sup>h</sup> . 22 <sup>m</sup> . 40 <sup>s</sup> ..	2	69. 17. 7.56	+ 15.513
* $\mathcal{R}$ . 1 <sup>h</sup> . 17 <sup>m</sup> . 16 <sup>s</sup> . SP.	4	33. 28. 8.98	- 18.927	14 Leonis.....	1	79. 22. 41.94	+ 16.046
* $\mathcal{R}$ . 1 <sup>h</sup> . 21 <sup>m</sup> . 45 <sup>s</sup> . SP.	1	33. 38. 22.41	- 18.793	$\nu$ Ursæ Majoris SP..	1	30. 12. 28.49	+ 16.404
$\eta$ Piscium.....	2	75. 29. 12.13	- 18.758	$\nu$ Ursæ Maj. SP. R..	1	31.10	
$\phi$ Piscium.....	1	81. 39. 16.92	- 18.289	$\nu$ Leonis.....	1	76. 47. 25.51	+ 16.894
$\epsilon$ Cassiopeiæ SP.....	1	27. 7. 34.67	- 18.068	$\eta$ Leonis.....	1	72. 27. 18.17	+ 17.305
$\epsilon$ Cassiopeiæ SP. R..	1	34.91		Regulus.....	3	77. 14. 54.76	+ 17.361
$\alpha$ Arietis.....	5	67. 18. 7.36	- 17.450	Regulus R.....	3	55.92	
$\alpha$ Arietis R.....	5	6.75		$\rho$ Leonis.....	2	79. 52. 0.83	+ 18.334
$i$ Persei.....	1	34. 53. 43.22	- 16.860	$l$ Leonis.....	2	78. 36. 15.51	+ 18.871
$i$ Persei R.....	1	47.72		* ( $z$ ) $\mathcal{R}$ . 10 <sup>h</sup> . 44 <sup>m</sup> . 38 <sup>s</sup> ..	2	26. 11. 42.46	+ 18.981
$\nu$ Arietis.....	1	68. 44. 20.05	- 15.928	* $\mathcal{R}$ . 10 <sup>h</sup> . 52 <sup>m</sup> . 24 <sup>s</sup> ..	2	26. 0. 51.03	+ 19.190
$\gamma$ Ceti.....	1	87. 26. 47.35	- 15.642	$\alpha$ Ursæ Majoris.....	15	27. 22. 53.42	+ 19.224
$\gamma$ Ceti R.....	1	46.01		$\alpha$ Ursæ Majoris R..	15	53.18	
$b$ Arietis.....	1	61. 25. 32.77	- 15.457	$\alpha$ Ursæ Majoris SP..	8	53.20	
$\pi$ Arietis R.....	1	33.32		$\alpha$ Ursæ Maj. SP. R..	8	52.87	
$\pi$ Arietis.....	2	73. 12. 34.94	- 15.346	$\chi$ Leonis.....	4	81. 47. 42.16	+ 19.294
$\epsilon$ Arietis.....	3	69. 18. 29.73	- 14.785	$\sigma$ Leonis.....	1	83. 5. 21.51	+ 19.633
$\alpha$ Ceti.....	2	86. 32. 46.29	- 14.554	* $\mathcal{R}$ . 11 <sup>h</sup> . 16 <sup>m</sup> . 48 <sup>s</sup> ..	2	26. 38. 8.57	+ 19.701
$\alpha$ Ceti R.....	2	45.12		$\tau$ Leonis.....	2	86. 15. 23.84	+ 19.746
$\delta$ Arietis.....	3	70. 53. 13.29	- 14.026	$\nu$ Leonis.....	2	89. 56. 6.83	+ 19.868
$\alpha$ Persei.....	3	40. 43. 5.38	- 13.362	* ( $p$ ) $\mathcal{R}$ . 11 <sup>h</sup> . 39 <sup>m</sup> . 23 <sup>s</sup> ..	1	83. 12. 54.80	+ 19.975
$\alpha$ Persei R.....	3	4.48		$\beta$ Leonis.....	4	74. 31. 41.02	+ 19.986
F Eridani.....	1	108. 0. 15.66	- 12.282	$\beta$ Leonis R.....	4	41.17	
$\nu$ Persei.....	1	47. 56. 11.86	- 11.913	$\beta$ Virginis.....	2	87. 19. 40.30	+ 19.996
$\nu$ Persei R.....	1	10.24		$\gamma$ Ursæ Majoris.....	11	35. 24. 36.16	+ 20.015
$\eta$ Tauri.....	4	66. 23. 53.84	- 11.650	$\gamma$ Ursæ Majoris R..	11	36.32	
$\eta$ Tauri R.....	4	53.48		$\gamma$ Ursæ Majoris SP..	3	35.57	
$\gamma^1$ Eridani.....	1	103. 58. 13.91	- 10.736	$\gamma$ Ursæ Maj. SP. R..	3	34.51	
$\gamma^1$ Eridani R.....	1	16.40		* ( $e$ ) $\mathcal{R}$ . 11 <sup>h</sup> . 50 <sup>m</sup> . 17 <sup>s</sup> ..	3	84. 45. 38.18	+ 20.038
$\Lambda^1$ Tauri.....	4	68. 21. 50.07	- 10.391	$\phi$ Virginis.....	2	80. 22. 22.13	+ 20.054
38 Eridani.....	1	97. 15. 43.67	- 9.723	* ( $f$ ) $\mathcal{R}$ . 11 <sup>h</sup> . 59 <sup>m</sup> . 20 <sup>s</sup> ..	3	84. 35. 23.14	+ 20.056
38 Eridani R.....	1	44.72		* ( $c$ ) $\mathcal{R}$ . 12 <sup>h</sup> . 3 <sup>m</sup> . 28 <sup>s</sup> ..	3	85. 2. 53.45	+ 20.054
$\nu^1$ Tauri.....	2	67. 33. 29.18	- 8.738	$\delta$ Ursæ Majoris SP..	2	32. 4. 18.89	+ 20.045
Aldebaran.....	5	73. 49. 13.57	- 7.940	$\delta$ Ursæ Majoris SP. R.	2	20.00	
Aldebaran R.....	5	13.53		$\kappa$ Draconis SP.....	3	19. 19. 23.56	+ 19.921
A.S.C. 552.....	1	23. 56. 29.84	- 7.017	$\kappa$ Draconis SP. R. ...	3	24.31	
A.S.C. 552. R.....	1	30.41		$\gamma^1$ Virginis.....	1	90. 33. 54.79	+ 19.841
A.S.C. 552. SP.....	2	28.78		$\psi$ Virginis.....	1	98. 39. 45.93	+ 19.653
A.S.C. 552. SP. R..	2	31.18		42 Virginis (?).....	4	81. 17. 15.69	+ 19.634
Capella.....	22	44. 10. 26.28	- 4.781	* $\mathcal{R}$ . 12 <sup>h</sup> . 47 <sup>m</sup> . 7 <sup>s</sup> ... }	4		
Capella R.....	22	26.64		Spica.....	5	100. 19. 7.13	+ 18.942
$\beta$ Tauri.....	6	61. 32. 7.96	- 3.814	Spica R.....	5	6.78	
$\beta$ Tauri R.....	6	7.54		$\alpha$ Virginis.....	1	107. 19. 46.02	+ 18.135
$\delta$ Orionis.....	4	90. 25. 27.26	- 3.154	$\eta$ Ursæ Majoris.....	7	39. 52. 51.09	+ 18.132
$\delta$ Orionis R.....	4	26.58		$\eta$ Ursæ Majoris R..	7	51.17	
$\epsilon$ Orionis.....	1	91. 18. 39.06	- 2.785	$\eta$ Bootis.....	7	70. 47. 33.09	+ 17.908
$\epsilon$ Orionis R.....	1	38.02		$\eta$ Bootis R.....	7	31.64	
$l$ Aurigæ.....	1	59. 36. 37.77	- 2.765	Arcturus.....	11	69. 58. 34.09	+ 18.952
$\alpha$ Columbæ.....	1	124. 9. 50.91	- 2.284	Arcturus R.....	11	34.53	



CATALOGUE of the Concluded Mean North Polar Distances, &c., *continued*.

Name of Star.	Number of Observations.	Mean N.P.D. Jan. 1, 1839.	Annual Variation.	Name of Star.	Number of Observations.	Mean N.P.D. Jan. 1, 1839.	Annual Variation.
$\lambda$ Virginis.....	2	102. 37. 33.16	+ 16,895	$\beta$ Lyrae's Comp. R.	2	56. 49. 51.40	- 3,840
A.S.C. 1668.....	3	110. 29. 18.67	+ 15,527	* $\mathcal{R}$ . 18 <sup>h</sup> . 48 <sup>m</sup> . 20 <sup>s</sup> ...	3	87. 43. 52.25	- 4,198
$\rho$ Librae.....	3	104. 46. 35.30	+ 15,525	S Sagittarii.....	3	121. 16. 28.56	- 4,689
$\epsilon$ Bootis.....	3	62. 14. 35.53	+ 15,477	A.S.C. 2212.....	4	118. 52. 38.06	- 4,968
$\epsilon$ Bootis R.....	3	36.21		$\delta$ Draconis.....	1	22. 37. 18.15	- 6,239
$\beta$ Ursae Minoris.....	8	15. 11. 11.32	+ 14,713	$\delta$ Draconis R.....	1	16.81	
$\beta$ Ursae Minoris R...	8	12.26		$\delta$ Draconis SP.....	1	18.96	
$\beta$ Ursae Minoris SP.	3	11.99		$\delta$ Draconis SP. R....	1	17.27	
$\beta$ Ursae Min. SP. R.	3	11.14		O Sagittarii.....	3	120. 3. 13.22	- 6,592
A.S.C. 1703.....	2	97. 12. 3.12	+ 14,552	$\gamma$ Aquilae.....	3	79. 46. 27.52	- 8,367
20 Librae.....	2	114. 38. 36.36	+ 14,509	$\gamma$ Aquilae R.....	3	25.72	
* $\mathcal{R}$ . 15 <sup>h</sup> . 8 <sup>m</sup> . 38 <sup>s</sup> ...	2	97. 15. 35.77	+ 13,637	$\alpha$ Aquilae.....	5	81. 33. 6.08	- 8,709
$\alpha^1$ Librae.....	2	104. 57. 45.95	+ 13,418	$\alpha$ Aquilae R.....	5	5.90	
* $\mathcal{R}$ . 15 <sup>h</sup> . 20 <sup>m</sup> . 30 <sup>s</sup> ...	3	106. 52. 47.30	+ 12,858	$\beta$ Aquilae.....	3	83. 59. 24.79	- 8,521
A.S.C. 1752.....	1	106. 41. 41.00	+ 12,819	$\beta$ Aquilae R.....	3	24.42	
$\alpha$ Coronae Borealis...	6	62. 44. 21.50	+ 12,355	$c$ Sagittarii.....	3	118. 9. 0.97	- 9,467
$\alpha$ Coronae Borealis R.	6	21.22		$\sigma$ Capricorni.....	2	109. 36. 54.82	- 10,788
$\chi$ Librae.....	3	113. 17. 18.13	+ 12,152	$\pi$ Capricorni.....	3	108. 44. 1.82	- 11,373
$\alpha$ Serpentis.....	3	83. 3. 47.94	+ 11,763	$\lambda$ Ursae Minoris.....	7	1. 10. 26.81	- 11,651
$\alpha$ Serpentis R.....	3	45.97		$\lambda$ Ursae Minoris R...	7	26.65	
$b$ Scorpii.....	1	115. 15. 19.87	+ 11,409	* $\mathcal{R}$ . 20 <sup>h</sup> . 24 <sup>m</sup> . 9 <sup>s</sup> ...	2	26. 37. 57.93	- 11,799
4 Scorpii.....	2	115. 47. 6.50	+ 11,085	$\theta$ Cephei.....	3	27. 32. 44.87	- 11,989
$\zeta$ Ursae Minoris.....	3	11. 42. 50.16	+ 10,781	$\alpha$ Cygni.....	14	45. 17. 30.59	- 12,619
$\zeta$ Ursae Minoris R...	3	48.91		$\alpha$ Cygni R.....	14	30.46	
$\zeta$ Ursae Minoris SP..	2	48.38		$\eta$ Capricorni.....	3	110. 29. 12.05	- 13,890
$\zeta$ Ursae Min. SP. R..	2	48.54		* $\mathcal{R}$ . 21 <sup>h</sup> . 1 <sup>m</sup> . 50 <sup>s</sup> ...	3	60. 26. 29.15	- 14,295
$\delta$ Scorpii.....	2	112. 9. 25.65	+ 10,716	* $\mathcal{R}$ . 21 <sup>h</sup> . 2 <sup>m</sup> . 22 <sup>s</sup> ...	2	25. 0. 6.31	- 14,327
$\eta$ Draconis.....	1	28. 7. 10.54	+ 8,331	* $\mathcal{R}$ . 21 <sup>h</sup> . 2 <sup>m</sup> . 39 <sup>s</sup> ...	3	25. 2. 0.46	- 14,345
$\eta$ Draconis R.....	1	11.53		$s$ Capricorni.....	3	105. 50. 9.92	- 14,599
$\eta$ Draconis SP.....	1	12.03		* $\mathcal{R}$ . 21 <sup>h</sup> . 9 <sup>m</sup> . 15 <sup>s</sup> ...	3	76. 42. 57.61	- 14,742
$\eta$ Draconis SP. R....	1	10.75		$\alpha$ Cephei.....	12	28. 5. 40.96	- 15,064
$n$ Herculis.....	3	84. 7. 49.24	+ 8,103	$\alpha$ Cephei R.....	12	41.28	
* $\mathcal{R}$ . 16 <sup>h</sup> . 30 <sup>m</sup> . 15 <sup>s</sup> ...	3	80. 11. 26.19	+ 7,655	$\alpha$ Cephei SP.....	1	42.22	
$i$ Herculis.....	3	81. 7. 7.61	+ 7,016	$\alpha$ Cephei SP. R.....	1	40.18	
$\iota$ Ophiuchi.....	4	79. 33. 51.55	+ 6,331	* $\mathcal{R}$ . 21 <sup>h</sup> . 20 <sup>m</sup> . 3 <sup>s</sup> ...	2	75. 23. 26.74	- 15,366
$\epsilon$ Ursae Minoris.....	6	7. 42. 33.58	+ 4,967	$\beta$ Aquarii.....	1	96. 16. 30.73	- 15,537
$\epsilon$ Ursae Minoris R...	6	33.16		$\beta$ Aquarii R.....	1	32.51	
* $\mathcal{R}$ . 17 <sup>h</sup> . 4 <sup>m</sup> . 40 <sup>s</sup> ...	3	89. 26. 46.04	+ 4,795	$\beta$ Cephei.....	7	20. 8. 42.44	- 15,727
$\alpha$ Herculis.....	3	75. 25. 15.09	+ 4,568	$\beta$ Cephei R.....	7	42.76	
$\alpha$ Herculis R.....	3	16.56		$\beta$ Cephei SP.....	1	44.74	
A.S.C. 1972.....	3	122. 22. 11.64	+ 4,523	$\beta$ Cephei SP. R.....	1	42.50	
* $\mathcal{R}$ . 17 <sup>h</sup> . 12 <sup>m</sup> . 30 <sup>s</sup> ...	3	61. 0. 16.23	+ 4,127	$\delta$ Capricorni.....	3	106. 51. 14.96	- 16,336
$\alpha$ Herculis.....	3	65. 20. 7.64	+ 3,977	$\alpha$ Aquarii.....	5	91. 5. 55.75	- 17,260
33 Scorpii.....	3	114. 5. 19.29	+ 3,890	$\alpha$ Aquarii R.....	5	57.10	
$\rho$ Herculis.....	3	52. 42. 7.13	+ 3,643	$\iota$ Aquarii.....	3	104. 38. 51.13	- 17,236
* $\mathcal{R}$ . 17 <sup>h</sup> . 18 <sup>m</sup> . 41 <sup>s</sup> ...	3	57. 10. 51.63	+ 3,596	$\theta$ Aquarii.....	3	98. 34. 55.92	- 17,722
* $\mathcal{R}$ . 17 <sup>h</sup> . 26 <sup>m</sup> . 7 <sup>s</sup> ...	3	55. 3. 28.69	+ 2,950	$\sigma$ Aquarii.....	3	101. 29. 57.00	- 18,254
$\alpha$ Ophiuchi.....	4	77. 19. 1.97	+ 2,836	* $\mathcal{R}$ . 22 <sup>h</sup> . 35 <sup>m</sup> . 24 <sup>s</sup> ...	2	24. 20. 1.57	- 18,705
$\alpha$ Ophiuchi R.....	4	2.48		* $\mathcal{R}$ . 22 <sup>h</sup> . 35 <sup>m</sup> . 55 <sup>s</sup> ...	1	24. 17. 13.16	- 18,721
79 Herculis.....	3	65. 35. 22.55	+ 2,543	$\mu$ Pegasi.....	12	67. 16. 46.43	- 18,810
A.S.C. 2042.....	1	121. 38. 21.34	+ 1,860	$\mu$ Pegasi.....	12	66. 14. 48.34	- 18,912
A.S.C. 2044.....	1	120. 31. 59.62	+ 1,835	$\iota$ Cephei.....	3	24. 38. 42.98	- 18,962
* $\mathcal{R}$ . 17 <sup>h</sup> . 46 <sup>m</sup> . 8 <sup>s</sup> ...	1	48. 11. 42.27	+ 1,213	$\iota$ Cephei SP.....	1	42.77	
* $\mathcal{R}$ . 17 <sup>h</sup> . 46 <sup>m</sup> . 31 <sup>s</sup> ...	1	48. 15. 52.51	+ 1,179	$\iota$ Cephei SP. R.....	1	42.37	
$\theta$ Herculis.....	2	52. 43. 26.25	+ 0,811	$\lambda$ Aquarii.....	2	98. 26. 3.10	- 18,972
$\gamma$ Draconis.....	3	38. 29. 21.38	+ 0,623	$\alpha$ Pegasi.....	6	75. 39. 34.26	- 19,297
* $\mathcal{R}$ . 18 <sup>h</sup> . 0 <sup>m</sup> . 30 <sup>s</sup> ...	3	44. 18. 27.67	- 0,044	$\alpha$ Pegasi R.....	6	34.39	
$\delta$ Ursae Minoris.....	6	3. 24. 31.91	- 2,105	$\phi$ Aquarii.....	2	96. 54. 55.52	- 19,502
$\delta$ Ursae Minoris R...	6	33.02		$\kappa^1$ Piscium.....	3	89. 37. 28.33	- 19,731
$\delta$ Ursae Minoris SP..	2	32.94		$\gamma$ Cephei.....	9	13. 15. 57.21	- 19,915
$\delta$ Ursae Min. SP. R..	2	32.39		$\gamma$ Cephei R.....	9	57.16	
* $\mathcal{R}$ . 18 <sup>h</sup> . 27 <sup>m</sup> . 20 <sup>s</sup> ...	3	107. 19. 55.14	- 2,386	$\lambda$ Piscium.....	1	89. 6. 18.24	- 19,952
* $\mathcal{R}$ . 18 <sup>h</sup> . 30 <sup>m</sup> . 8 <sup>s</sup> ...	1	38. 23. 27.96	- 2,629	$\delta$ Ap. Sculp.....	2	119. 1. 10.52	- 19,983
* $\mathcal{R}$ . 18 <sup>h</sup> . 30 <sup>m</sup> . 47 <sup>s</sup> ...	2	38. 20. 36.42	- 2,686	$\omega$ Piscium.....	4	84. 1. 39.15	- 20,040
$\alpha$ Lyrae.....	15	51. 21. 44.01	- 2,748	$q$ Piscium.....	1	93. 55. 23.92	- 20,048
$\alpha$ Lyrae R.....	15	43.37		* $\mathcal{R}$ . 23 <sup>h</sup> . 53 <sup>m</sup> . 39 <sup>s</sup> ...	1	25. 26. 36.50	- 20,048
$\beta$ Lyrae.....	6	56. 49. 11.41	- 3,840	* $\mathcal{R}$ . 23 <sup>h</sup> . 54 <sup>m</sup> . 16 <sup>s</sup> ...	3	26. 21. 28.85	- 20,050
$\beta$ Lyrae R.....	6	12.13		* $\mathcal{R}$ . 23 <sup>h</sup> . 56 <sup>m</sup> . 54 <sup>s</sup> ...	2	26. 6. 55.77	- 20,054
$\beta$ Lyrae's Companion.	2	56. 49. 51.12	- 3,840	* $\mathcal{R}$ . 23 <sup>h</sup> . 58 <sup>m</sup> . 7 <sup>s</sup> ...	2	26. 42. 0.77	- 20,055

SIDEREAL INTERVALS OCCUPIED BY TRANSITS OF DIAMETERS,

AND

VERTICAL DIAMETERS,

OF THE

SUN, MOON, AND PLANETS,

DEDUCED

FROM THE TRANSIT AND CIRCLE OBSERVATIONS, AND COMPARED  
WITH THOSE OF THE NAUTICAL ALMANAC.

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1839.



I. SIDEREAL INTERVALS occupied by TRANSITS of the SUN'S DIAMETER across the Meridian, and VERTICAL DIAMETERS of the SUN; compared with those of the NAUTICAL ALMANAC.

Day of Observation.	Interval by Observation.	Seconds of Tabular Interval.	Excess of Latter.	Vertical Diameter by Observation.	Seconds of Tabular Diameter.	Excess of Latter.	Day of Observation.	Interval by Observation.	Seconds of Tabular Interval.	Excess of Latter.	Vertical Diameter by Observation.	Seconds of Tabular Diameter.	Excess of Latter.
1839.	m. s.	s.	s.	" "	" "	" "	1839.	m. s.	s.	s.	" "	" "	" "
Jan. 8	2 . 21,51	21,20	- 0,31	32 . 34,18	34,20	+ 0,02	May 23	2 . 16,10	15,40	- 0,70	31 . 37,37	37,20	- 0,17
9	21,23	21,06	- 0,17	36,51	34,20	- 2,31	27	16,39	15,98	- 0,41	34,96	36,00	+ 1,04
10	21,17	20,90	- 0,27	32,72	34,00	+ 1,28	28	16,70	16,12	- 0,58	37,36	35,60	- 1,76
12	20,83	20,58	- 0,25	34,46	33,80	- 0,66	29	16,89	16,24	- 0,65	33,82	35,40	+ 1,58
15	20,46	20,06	- 0,40	33,96	33,40	- 0,56	30	16,90	16,36	- 0,54	35,92	35,00	- 0,92
16	20,21	19,88	- 0,33	32,92	33,20	+ 0,28	June 1	17,17	16,60	- 0,57	32,81	34,40	+ 1,59
17	20,10	19,68	- 0,42	32,77	33,20	+ 0,43	6	17,55	17,10	- 0,45	35,21	33,20	- 2,01
18	19,85	19,48	- 0,37	32,50	33,00	+ 0,50	8				36,06	32,80	- 3,26
22	19,03	18,68	- 0,35	31,09	32,20	+ 1,11	10	17,83	17,42	- 0,41	32,54	32,20	- 0,34
24	18,67	18,24	- 0,43	32,04	31,80	- 0,24	11	17,99	17,48	- 0,51	30,06	32,00	+ 1,94
29	17,00	17,14	+ 0,14	26,91	30,60	+ 3,69	12	17,88	17,54	- 0,34	32,09	31,80	- 0,29
30	16,84	16,90	+ 0,06	27,31	30,40	+ 3,09	13	17,98	17,60	- 0,38	31,22	31,80	+ 0,58
31	16,58	16,66	+ 0,08	33,38	30,00	- 3,38	17	18,21	17,74	- 0,47	29,18	31,20	+ 2,02
Feb. 1	16,38	16,44	+ 0,06	30,19	29,80	- 0,39	18	18,36	17,76	- 0,60	29,53	31,00	+ 1,47
2	16,07	16,22	+ 0,15	28,51	29,40	+ 0,89	20	18,04	17,78	- 0,26	32,40	30,80	- 1,60
13	13,61	13,74	+ 0,13	26,42	25,40	- 1,02	21	18,48	17,78	- 0,70	29,01	30,80	+ 1,79
14	13,37	13,52	+ 0,15	24,95	25,00	+ 0,05	24	17,93	17,76	- 0,17	28,97	30,60	+ 1,63
15	13,37	13,30	- 0,07	25,18	24,60	- 0,58	25				27,78	30,40	+ 2,62
16	12,90	13,10	+ 0,20	23,58	24,20	+ 0,62	28	18,10	17,62	- 0,48	28,00	30,20	+ 2,20
21	12,38	12,12	- 0,26				July 4	17,51	17,20	- 0,31	30,13	30,20	+ 0,07
26	11,47	11,24	- 0,23	18,94	19,80	+ 0,86	6	17,30	17,02	- 0,28	32,17	30,20	- 1,97
27	11,22	11,08	- 0,14	21,35	19,40	- 1,95	10				29,75	30,40	+ 0,65
28	11,13	10,92	- 0,21	17,67	19,00	+ 1,33	11	16,90	16,48	- 0,42	29,53	30,40	+ 0,87
Mar. 4	10,68	10,34	- 0,34	14,99	16,80	+ 1,81	13	16,73	16,24	- 0,49	29,85	30,60	+ 0,75
8	10,14	9,84	- 0,30	13,86	14,80	+ 0,94	15	16,66	15,96	- 0,70	30,84	30,80	- 0,04
9	10,07	9,72	- 0,35	12,74	14,40	+ 1,66	16				31,60	31,00	+ 0,60
11	9,82	9,52	- 0,30	8,76	13,20	+ 4,44	17	16,04	15,68	- 0,36	30,56	31,00	+ 0,44
12	9,70	9,42	- 0,28	9,29	12,80	+ 3,51	22	15,33	14,92	- 0,41	32,74	31,80	- 0,94
16	9,50	9,12	- 0,38	7,04	10,60	+ 3,56	24	14,86	14,60	- 0,26			
26	9,23	8,78	- 0,45	2,45	5,20	+ 2,75	26	14,56	14,28	- 0,28	31,75	32,60	+ 0,85
28	8,93	8,78	- 0,15	2,90	4,00	+ 1,10	27	14,46	14,10	- 0,36	35,17	32,80	- 2,37
30	8,70	8,80	+ 0,10	32 . 2,49	3,00	+ 0,51	Aug. 2	13,51	13,08	- 0,43	34,40	34,20	- 0,20
Apr. 10	9,65	9,34	- 0,31	31 . 57,46	56,80	- 0,66	3	13,34	12,90	- 0,44	37,08	34,60	- 2,48
11	10,00	9,42	- 0,58	53,22	56,40	+ 3,18	5	12,99	12,56	- 0,43	34,72	35,00	+ 0,28
16	10,23	9,88	- 0,35	50,56	53,60	+ 3,04	6	12,76	12,38	- 0,38	36,35	35,40	- 0,95
17				49,85	53,20	+ 3,35	13	12,29	11,22	- 1,07	36,43	37,60	+ 1,17
18				51,53	52,60	+ 1,07	21				42,36	40,60	- 1,76
19	10,68	10,22	- 0,46	51,00	52,00	+ 1,00	22				39,76	41,00	+ 1,24
20	10,66	10,34	- 0,32	51,91	51,60	- 0,31	23				40,14	41,40	+ 1,26
22	10,82	10,60	- 0,22	50,50	50,60	+ 0,10	24	9,95	9,64	- 0,31	38,47	42,00	+ 3,53
24	11,10	10,88	- 0,22	49,28	49,60	+ 0,32	26	9,21	9,40	+ 0,19	41,98	42,80	+ 0,82
25				48,04	49,00	+ 0,96	27				44,32	43,20	- 1,12
29	11,99	11,60	- 0,39	48,38	47,20	- 1,18	29				42,80	44,00	+ 1,20
30	12,19	11,74	- 0,45				Sept. 2	8,57	8,68	+ 0,11	44,33	45,80	+ 1,47
May 1	12,30	11,90	- 0,40	45,04	46,20	+ 1,16	6	8,21	8,38	+ 0,17	45,04	47,60	+ 2,56
2	12,33	12,04	- 0,29	46,14	45,80	- 0,34	9	8,07	8,20	+ 0,13	49,39	49,20	- 0,19
3	12,56	12,20	- 0,36	46,24	45,20	- 1,04	10	8,15	8,16	+ 0,01	48,50	49,60	+ 1,10
4	12,79	12,36	- 0,43	41,38	44,80	+ 3,42	13				49,96	51,20	+ 1,24
6	13,26	12,68	- 0,58	42,92	43,80	+ 0,88	14	7,76	8,04	+ 0,28	50,73	51,80	+ 1,07
7	13,29	12,84	- 0,45	42,93	43,40	+ 0,47	18				52,37	53,80	+ 1,43
8	13,38	13,00	- 0,38	43,64	43,00	- 0,64	19	8,22	8,04	- 0,18	54,45	54,40	- 0,05
14	14,45	13,98	- 0,47	40,98	40,40	- 0,58	20	8,37	8,06	- 0,31	53,36	55,00	+ 1,64
15	14,58	14,16	- 0,42	38,60	40,00	+ 1,40	23	8,26	8,14	- 0,12	55,38	56,60	+ 1,22
16	14,72	14,32	- 0,40				24	8,46	8,18	- 0,28	55,38	57,20	+ 1,82
17	15,00	14,48	- 0,52	38,24	39,20	+ 0,96	26	8,67	8,26	- 0,41	57,38	58,20	+ 0,82
18	2 . 14,92	14,64	- 0,28	31 . 40,08	39,10	- 0,98	27	2 . 8,40	8,32	- 0,08	31 . 58,04	58,80	+ 0,76

Day of Observation.	Interval by Observation.	Seconds of Tabular Interval.	Excess of Latter.	Vertical Diameter by Observation.	Seconds of Tabular Diameter.	Excess of Latter.	Day of Observation.	Interval by Observation.	Seconds of Tabular Interval.	Excess of Latter.	Vertical Diameter by Observation.	Seconds of Tabular Diameter.	Excess of Latter.
1839.	m. s.	s.	s.	" "	" "	" "	1839.	m. s.	s.	s.	" "	" "	" "
Oct. 1				32. 2,24	1,00	- 1,24	Nov. 9	2. 15,71	15,54	- 0,17	32. 21,30	21,40	+ 0,10
2	2. 8,77	8,68	- 0,09	1,82	1,40	- 0,42	11	16,49	16,02	- 0,47	20,62	22,40	+ 1,78
3	9,17	8,76	- 0,41	2,96	2,00	- 0,96	20	18,44	18,12	- 0,32	25,42	26,20	+ 0,78
7	9,67	9,18	- 0,49	5,58	4,20	- 1,38	23	19,01	18,78	- 0,23	26,70	27,20	+ 0,50
9				3,99	5,40	+ 1,41	25	19,52	19,20	- 0,32	29,17	28,00	- 1,17
10	9,86	9,56	- 0,30	4,13	5,80	+ 1,67	26	19,81	19,40	- 0,41	27,40	28,40	+ 1,00
11	10,15	9,70	- 0,45	6,28	6,40	+ 0,12	27	20,01	19,60	- 0,41	29,66	28,60	- 1,06
12	10,12	9,86	- 0,26	5,55	7,00	+ 1,45							
14	10,33	10,16	- 0,17	6,71	8,20	+ 1,49	Dec. 14	22,45	22,04	- 0,41	32,22	33,00	+ 0,78
16	11,10	10,48	- 0,62	8,95	9,20	+ 0,25	16	22,51	22,18	- 0,33	31,54	33,40	+ 1,86
17	11,11	10,64	- 0,47	10,15	9,80	- 0,35	17	22,31	22,24	- 0,07	31,68	33,60	+ 1,92
26	12,63	12,36	- 0,27	13,88	14,60	+ 0,72	21	22,58	22,40	- 0,18	26,22	34,00	+ 7,78
30	13,51	13,24	- 0,27	15,54	16,40	+ 0,86	24				32. 32,85	34,40	+ 1,55
Nov. 4	2. 14,49	14,36	- 0,13	32. 17,49	19,00	+ 1,51	27	2. 22,65	22,32	- 0,33			

II. SIDEREAL INTERVALS occupied by TRANSITS of the MOON'S DIAMETER across the Meridian, and VERTICAL DIAMETERS of the MOON, compared with those of the NAUTICAL ALMANAC.

Day of Observation.	Interval by Observation.	Seconds of Tabular Interval.	Excess of Latter.	Calculated Error of Tabular Diameter.	Day of Observation.	Vertical Diameter by Observation.	Seconds of Tabular Diameter.	Excess of Latter.
1839.	m. s.	s.	s.	"	1839.	" "	" "	" "
Feb. 27	2. 6,74	5,98	- 0,76	- 10,83	July 22	30. 14,20	6,24	- 7,96
Apr. 28	2. 8,88	8,18	- 0,70	- 9,65	Aug. 24	32. 14,39	12,48	- 1,91
Aug. 24	2. 15,99	16,50	(+ 0,51)	- 6,94*	Sept. 22	32. 58,82	51,30	- 7,52
Nov. 20	2. 34,00	33,40	- 0,60	- 7,85				
Dec. 27	2. 4,71	4,10	- 0,61	- 8,80				
* Calculated on the supposition of an error of 1' in observing one of the limbs.								



### III. VERTICAL DIAMETERS *of VENUS, compared with those of the NAUTICAL ALMANAC.*

Day of Observation.	Diameter by Observation.	Tabular Diameter.	Excess of Latter.	Day of Observation.	Diameter by Observation.	Tabular Diameter.	Excess of Latter.	Day of Observation.	Diameter by Observation.	Tabular Diameter.	Excess of Latter.
1839.	"	"	"	1839.	"	"	"	1839.	"	"	"
Jan. 8	10,34	9,80	- 0,54	May 2	14,08	12,40	- 1,68	Aug. 5	27,12	26,40	- 0,72
10	8,56	9,80	+ 1,24	3	14,50	12,40	- 2,10	22	33,14	33,40	+ 0,26
16	9,26	9,80	+ 0,54	4	13,46	12,40	- 1,06	29	37,00	37,20	+ 0,20
24	10,22	9,80	- 0,42	7	13,50	12,60	- 0,90				
30	10,22	9,80	- 0,42	14	15,68	13,20	- 2,48	Sept. 2	40,88	39,80	- 1,08
Feb. 2	11,42	9,80	- 1,62	17	14,16	13,40	- 0,76	9	44,42	44,40	- 0,02
16	11,38	10,00	- 1,38	18	15,78	13,40	- 2,38	10	46,18	45,20	- 0,98
21	11,50	10,20	- 1,30	28	15,26	14,20	- 1,06	16	47,12	49,60	+ 2,48
26	11,24	10,20	- 1,04	29	15,54	14,20	- 1,34	18	50,22	51,00	+ 0,78
28	11,62	10,20	- 1,42	30	14,96	14,40	- 0,56				
Mar. 4	10,68	10,40	- 0,28	June 1	15,24	14,60	- 0,64	Oct. 10	62,44	59,00	- 3,44
8	12,92	10,40	- 2,52	6	15,20	15,00	- 0,20	11	65,64	58,80	- 6,84
11	11,18	10,40	- 0,78	11	17,18	15,60	- 1,58	13	61,42	58,00	- 3,42
25	12,46	10,80	- 1,66	17	17,96	16,20	- 1,76	15	61,22	57,00	- 4,22
				20	18,88	16,60	- 2,28	16	61,08	56,40	- 4,68
April 10	12,06	11,40	- 0,66					25	54,26	50,40	- 3,86
11	11,76	11,40	- 0,36	July 1	18,60	18,20	- 0,40	27	49,30	49,00	- 0,30
17	12,34	11,60	- 0,74	3	18,44	18,40	- 0,04	Nov. 19	36,02	34,40	- 1,62
18	12,76	11,60	- 1,16	5	19,72	18,80	- 0,92	21	35,68	33,40	- 2,28
19	12,40	11,80	- 0,60	6	21,40	19,00	- 2,40	22	34,78	32,80	- 1,98
20	12,62	11,80	- 0,82	11	21,42	20,00	- 1,42	26	34,00	31,20	- 2,80
22	11,52	11,80	+ 0,28	13	21,92	20,40	- 1,52	29	32,80	29,80	- 3,00
25	12,20	12,00	- 0,20	15	22,06	20,80	- 1,26				
26	12,62	12,00	- 0,62	Aug. 1	25,98	25,20	- 0,78	Dec. 3	30,08	28,20	- 1,88
29	10,70	12,20	+ 1,50	2	27,02	25,40	- 1,62	12	28,56	25,40	- 3,16
May 1	13,36	12,40	- 0,96	3	25,54	25,80	+ 0,26	27	22,84	21,60	- 1,24
								29	22,80	21,20	- 1,60

### IV. SIDEREAL INTERVALS *occupied by TRANSITS of MARS' DIAMETER, and VERTICAL DIAMETERS of MARS; compared with those of the NAUTICAL ALMANAC.*

Day of Observation.	Interval by Observation.	Tabular Interval.	Excess of Latter.	Vertical Diameter by Observation.	Tabular Diameter.	Excess of Latter.	Day of Observation.	Vertical Diameter by Observation.	Tabular Diameter.	Excess of Latter.
1839.	s.	s.	s.	"	"	"	1839.	"	"	"
Feb. 23				16,62	12,60	- 4,02	April 6	14,26	12,40	- 1,86
25				15,04	12,80	- 2,24	19	13,02	11,40	- 1,62
26				14,58	12,80	- 1,78	25	13,96	10,80	- 3,16
27				15,62	13,00	- 2,62	29	14,24	10,40	- 3,84
28				14,66	13,00	- 1,66	30	13,50	10,40	- 3,10
Mar. 1				14,58	13,00	- 1,58	May 3	12,58	10,20	- 2,38
6				16,38	13,20	- 3,18	7	11,56	9,80	- 1,76
8				15,72	13,20	- 2,52	8	12,28	9,80	- 2,48
9	1,69	0,88	- 0,81	15,74	13,20	- 2,54	10	12,24	9,60	- 2,64
11	1,55	0,90	- 0,65	14,88	13,40	- 1,48	11	11,64	9,60	- 2,04
13	1,27	0,90	- 0,37	15,54	13,40	- 2,14	17	10,02	9,20	- 0,82
19	1,24	0,90	- 0,34	15,26	13,40	- 1,86				
27	1,32	0,86	- 0,46	15,22	13,00	- 2,22				

V. SIDEREAL INTERVALS *occupied by* TRANSITS of JUPITER'S DIAMETER, and VERTICAL DIAMETERS of JUPITER; compared with those of the NAUTICAL ALMANAC.

Day of Observation.	Interval by Observation.	Tabular Interval.	Excess of Latter.	Vertical Diameter by Observation.	Tabular Diameter.	Excess of Latter.	Day of Observation.	Interval by Observation.	Tabular Interval.	Excess of Latter.	Vertical Diameter by Observation.	Tabular Diameter.	Excess of Latter.
1839.	s.	s.	s.	"	"	"	1839.	s.	s.	s.	"	"	"
Mar. 9	3,22	2,94	-0,28	41,62	40,60	-1,02	May 29	3,27	2,74	-0,53	41,10	38,00	-3,10
11	3,22	2,96	-0,26	41,90	40,60	-1,30							
13	3,17	2,96	-0,21	41,74	40,80	-0,94	June 1	2,94	2,72	-0,22	40,16	37,80	-2,36
19	3,24	2,98	-0,26	41,74	41,20	-0,54	4	2,69	2,70	+0,01	39,38	37,40	-1,98
20	3,32	2,98	-0,34	42,88	41,20	-1,68	10	2,72	2,66	-0,06	38,08	36,80	-1,28
21	3,40	2,98	-0,42	41,10	41,20	+0,10	12	2,74	2,64	-0,10	38,30	36,60	-1,70
27	3,37	3,00	-0,37	42,78	41,40	-1,38	17	2,66	2,60	-0,06	36,88	36,00	-0,88
							19	2,95	2,58	-0,37	37,94	35,80	-2,14
Apr. 5	3,12	2,98	-0,14	43,00	41,40	-1,60	22	3,53	2,56	-0,97	35,38	35,40	+0,02
6	3,24	2,98	-0,26	42,58	41,40	-1,18	24	2,74	2,54	-0,20	33,08	35,20	+2,12
11	3,53	2,98	-0,55	41,16	41,40	+0,24	25	2,91	2,52	-0,39	36,22	35,20	-1,02
17	3,04	2,98	-0,06	42,30	41,20	-1,10							
19	3,39	2,96	-0,43	41,64	41,20	-0,44	July 4	2,96	2,48	-0,48	35,94	34,20	-1,74
20	3,34	2,96	-0,38				11	2,18	2,42	+0,24	33,68	33,60	-0,08
25	3,24	2,94	-0,30	42,02	40,80	-1,22	13	2,32	2,40	+0,08	34,22	33,40	-0,82
29	3,13	2,92	-0,21	42,34	40,60	-1,74	15	2,69	2,38	-0,31	32,42	33,20	+0,78
30	3,31	2,92	-0,39	42,66	40,60	-2,06	25	2,59	2,34	-0,25			
May 3	3,14	2,90	-0,24	41,32	40,40	-0,92	Aug. 1	2,70	2,30	-0,40			
7	3,14	2,90	-0,24	42,00	40,00	-2,00	2	2,46	2,28	-0,18	29,00	31,80	(+2,80)
17	3,47	2,82	-0,65	40,16	39,20	-0,96	3	2,58	2,28	-0,30	25,08	31,60	(+6,52)
21	3,24	2,80	-0,44	40,18	38,80	-1,38							
22	3,17	2,78	-0,39	40,80	38,80	-2,00	Dec. 12	2,24	2,22	-0,02	31,34	30,20	-1,14
25	2,96	2,76	-0,20	39,50	38,40	-1,10	20	2,56	2,26	-0,30			
27	2,81	2,76	-0,05	40,10	38,20	-1,90	22	2,69	2,26	-0,43	30,56	30,60	+0,04
28	3,03	2,74	-0,29	39,62	38,20	-1,42	27				26,70	31,00	(+4,30)

VI. SIDEREAL INTERVALS *occupied by* TRANSITS of SATURN'S RING, and VERTICAL DIAMETERS of SATURN; compared with those of the NAUTICAL ALMANAC.

Day of Observation.	Interval by Observation.	Tabular Interval.	Excess of Latter.	Vertical Diameter by Observation.	Tabular Diameter.	Excess of Latter.	Day of Observation.	Interval by Observation.	Tabular Interval.	Excess of Latter.	Vertical Diameter by Observation.	Tabular Diameter.	Excess of Latter.
1839.	s.	s.	s.	"	"	"	1839.	s.	s.	s.	"	"	"
Feb. 12	2,64	2,55	-0,09	15,48	14,80	-0,68	June 12	3,07	2,92	-0,15			
14	2,88	2,55	-0,33	17,16	14,80	-2,36	15	3,49	2,92	-0,57	17,58	16,60	-0,98
24	3,03	2,59	-0,44	16,12	15,00	-1,12	19	3,35	2,87	-0,48	17,12	16,60	-0,52
25	3,17	2,64	-0,53	17,78	15,00	-2,78	24	3,09	2,87	-0,22	16,54	16,60	+0,06
May 3	3,33	2,87	-0,46	15,80	16,60	+0,80	July 1	3,07	2,87	-0,20	17,96	16,40	-1,56
6	3,07	2,87	-0,20	16,70	16,60	-0,10	3	3,14	2,87	-0,27			
14	3,01	2,87	-0,14	20,90	16,60	-4,30	4	3,11	2,87	-0,24	18,46	16,40	-2,06
15	2,99	2,87	-0,12				5				17,60	16,40	-1,20
16	3,49	2,87	-0,62	18,88	16,60	-2,28	6	3,29	2,82	-0,47	17,66	16,40	-1,26
17	3,26	2,87	-0,39	17,34	16,60	-0,74	15	3,22	2,82	-0,40			
21	3,44	2,92	-0,52	17,74	16,60	-1,14	18	3,00	2,82	-0,18	16,86	16,00	-0,86
25	3,41	2,92	-0,49	16,52	16,60	+0,08	20	2,89	2,82	-0,07			
27	3,61	2,92	-0,69	16,52	16,60	+0,08	22	3,11	2,82	-0,29	16,12	16,00	-0,12
29	3,46	2,92	-0,54	14,98	16,60	+1,62	24	3,32	2,78	-0,54			
June 1	3,36	2,92	-0,44	15,76	16,60	+0,84	Aug. 2	3,04	2,78	-0,26	18,56	15,80	-2,76
4	2,87	2,92	+0,05	16,50	16,60	+0,10	8	2,93	2,73	-0,20			
8	3,22	2,92	-0,30	18,44	16,60	-1,84							





CONCLUDED  
RIGHT ASCENSIONS AND NORTH POLAR DISTANCES

OF THE CENTERS OF THE

SUN, MOON, AND PLANETS,

OBSERVED IN THE YEAR 1839,

COMPARED WITH THE RIGHT ASCENSIONS AND NORTH POLAR DISTANCES  
INTERPOLATED FROM THE NAUTICAL ALMANAC;

WITH THE

GREENWICH MEAN SOLAR TIMES OF OBSERVATION.



Greenwich Mean Solar Time of Transit of Center.				Limb Observed.	R. A. of Center from Observation.	Seconds of Tabular R.A.	Error of Tables.	Limb Observed.	N.P.D. of Center from Observation.	Seconds of Tabular N.P.D.	Error of Tables.
d.	h.	m.	s.		h. m. s.	s.	s.		° ' "	"	"
Jan.	8.	0.	6.29,6		19.16.18,69	18,50	-0,19		112.18.12,54	12,83	+0,29
	9.	0.	6.54,8		19.20.40,53	40,44	-0,09		112.10.1,59	2,24	+0,65
	10.	0.	7.19,7		19.25.2,05	1,86	-0,19		112.1.24,26	25,55	+1,29
	12.	0.	8.7,5		19.33.43,16	43,03	-0,13		111.42.53,21	54,76	+1,55
	15.	0.	9.14,7		19.46.40,21	40,18	-0,03		111.11.58,93	59,48	+0,55
	16.	0.	9.36,0		19.50.58,12	57,91	-0,21		111.0.52,57	51,79	-0,78
	17.	0.	9.56,2		19.55.14,94	14,93	-0,01		110.49.18,04	20,09	+2,05
	18.	0.	10.16,1		19.59.31,44	31,23	-0,21		110.37.22,56	24,70	+2,14
	22.	0.	11.27,2		20.16.28,99	28,85	-0,14		109.45.50,16	52,53	+2,37
	24.	0.	11.58,0		20.24.52,98	52,94	-0,04		109.17.51,55	53,24	+1,69
	29.	0.	13.1,3		20.45.39,26	38,86	-0,40		108.1.49,38	51,26	+1,88
	30.	0.	13.11,2		20.49.45,71	45,57	-0,14		107.45.38,81	39,57	+0,76
	31.	0.	13.20,6		20.53.51,70	51,46	-0,24		107.29.6,90	8,88	+1,98
Feb.	1.	0.	13.29,0		20.57.56,71	56,52	-0,19		107.12.17,87	19,68	+1,81
	2.	0.	13.36,9		21.2.1,13	0,77	-0,36		106.55.9,86	12,29	+2,43
	13.	0.	14.8,8		21.45.55,25	55,04	-0,21		103.28.44,88	45,53	+0,65
	14.	0.	14.7,1		21.49.50,15	49,86	-0,29		103.8.31,10	31,74	+0,64
	15.	0.	14.4,8		21.53.44,30	43,93	-0,37		102.48.2,57	5,14	+2,57
	16.	0.	14.1,1		21.57.37,18	37,26	+0,08		102.27.25,43	26,14	+0,71
	21.	0.	13.34,7		22.16.53,45	53,15	-0,30	N.	100.41.21,26	21,86	+0,60
	26.	0.	12.51,1		22.35.52,50	52,38	-0,12		98.51.11,71	13,87	+2,16
	27.	0.	12.40,7		22.39.38,64	38,40	-0,24		98.28.44,75	47,47	+2,72
	28.	0.	12.29,7		22.43.24,23	23,86	-0,37		98.6.10,85	13,67	+2,82
Mar.	4.	0.	11.39,8		22.58.20,39	20,59	+0,20		96.34.51,20	51,88	+0,68
	8.	0.	10.43,6		23.13.10,22	10,16	-0,06		95.1.59,51	60,98	+1,47
	9.	0.	10.28,5		23.16.51,67	51,59	-0,08		94.38.36,03	37,08	+1,05
	11.	0.	9.57,3		23.24.13,48	13,41	-0,07		93.51.36,03	38,69	+2,66
	12.	0.	9.41,2		23.27.53,89	53,84	-0,05		93.28.3,10	4,99	+1,89
	16.	0.	8.34,3		23.42.32,97	32,76	-0,21		91.53.26,94	29,39	+2,45
	25.	0.	5.51,8	II.	0.15.19,07	18,89	-0,18	N.	88.20.21,45	23,39	+1,94
	26.	0.	5.33,3		0.18.57,10	56,80	-0,30		87.56.48,17	50,18	+2,01
	28.	0.	4.55,8		0.26.12,59	12,56	-0,03		87.9.51,06	52,48	+1,42
	30.	0.	4.18,9		0.33.28,67	28,38	-0,29		86.23.6,72	8,38	+1,66
Apr.	10.	0.	1.3,5		1.13.34,80	34,60	-0,20		82.12.5,40	4,46	-0,94
	11.	0.	0.46,9		1.17.14,72	14,66	-0,06		81.49.54,21	54,66	+0,45
	15.	23.	59.29,2		1.35.39,59	39,61	+0,02		80.1.11,97	14,65	+2,68
	16.	23.	59.14,8	II.	1.39.21,66	21,63	-0,03		79.39.57,80	59,05	+1,25
	17.	23.	59.0,8	II.	1.43.4,18	4,01	-0,17		79.18.53,40	53,64	+0,24
	18.	23.	58.47,0		1.46.46,93	46,76	-0,17		78.57.57,58	58,94	+1,36
	19.	23.	58.33,6		1.50.30,06	29,91	-0,15		78.37.14,15	15,14	+0,99
	21.	23.	58.8,2		1.57.57,70	57,41	-0,29		77.56.21,42	21,93	+0,51
	23.	23.	57.44,4		2.5.26,96	26,63	-0,33		77.16.15,20	16,62	+1,42
	24.	23.	57.33,0	II.	2.9.12,05	11,91	-0,14		76.56.31,76	32,72	+0,96
	28.	23.	56.52,8		2.24.17,94	17,85	-0,09		75.39.48,03	48,90	+0,87
	29.	23.	56.44,1		2.28.5,83	5,62	-0,21	S.	75.21.9,89	12,30	+2,41
	30.	23.	56.35,9		2.31.54,11	53,93	-0,18		75.2.48,69	50,00	+1,31
May	1.	23.	56.28,2		2.35.42,93	42,78	-0,15		74.44.40,86	42,49	+1,63
	2.	23.	56.21,1		2.39.32,37	32,20	-0,17		74.26.48,60	49,89	+1,29
	3.	23.	56.14,6		2.43.22,48	22,18	-0,30		74.9.11,68	12,48	+0,80
	5.	23.	56.2,7		2.51.3,69	3,85	+0,16		73.34.43,96	44,78	+0,82
	6.	23.	55.58,3		2.54.55,76	55,57	-0,19		73.17.55,15	55,07	-0,08
	7.	23.	55.54,0		2.58.48,03	47,86	-0,17		73.1.20,59	21,97	+1,38
	13.	23.	55.40,6		3.22.13,89	14,01	+0,12		71.28.10,09	8,34	-1,75
	14.	23.	55.40,7		3.26.10,56	10,41	-0,15		71.13.40,08	39,83	-0,25
	15.	23.	55.41,1		3.30.7,52	7,37	-0,15				
	16.	23.	55.42,0		3.34.4,96	4,89	-0,07		70.45.39,81	40,02	+0,21
	17.	23.	55.43,5		3.38.3,06	2,95	-0,11		70.32.8,52	9,41	+0,89
	22.	23.	55.58,9		3.58.1,31	1,30	-0,01		69.29.39,62	39,39	-0,23
	26.	23.	56.20,7		4.14.9,35	9,19	-0,16		68.45.57,37	57,16	-0,21
	27.	23.	56.27,4		4.18.12,61	12,39	-0,22		68.35.55,44	55,86	+0,42
	28.	23.	56.34,5		4.22.16,28	16,05	-0,23		68.26.14,47	16,65	+2,18
	29.	23.	56.41,9		4.26.20,33	20,19	-0,14		68.16.59,95	59,75	-0,20
	31.	23.	56.58,4		4.34.29,97	29,80	-0,17		67.59.33,01	33,53	+0,52
June	5.	23.	57.46,8		4.55.1,24	1,01	-0,23		67.22.40,67	41,60	+0,93
	7.	23.	58.8,4	II.	5.3.16,10	16,03	-0,07		67.10.42,43	41,79	-0,64

Greenwich Mean Solar Time of Transit of Center.				Limb Observed.	R. A. of Center from Observation.	Seconds of Tabular R.A.	Error of Tables.	Limb Observed.	N.P.D. of Center from Observation.	Seconds of Tabular N.P.D.	Error of Tables.
d.	h.	m.	s.		h. m. s.	s.	s.		° ' "	"	"
June	9.	23.	58.31,7		5.11.32,52	32,25	-0,27		67.0.17,92	18,27	+0,35
	10.	23.	58.43,4		5.15.40,88	40,76	-0,12		66.55.42,76	42,77	+0,01
	11.	23.	58.55,4		5.19.49,43	49,49	+0,06		66.51.30,59	31,66	+1,07
	12.	23.	59.7,6		5.23.58,19	58,41	+0,22		66.47.45,19	45,06	-0,13
	16.	23.	59.58,8		5.40.35,77	35,52	-0,25		66.36.43,49	44,73	+1,24
	18.	0.	0.11,2		5.44.44,83	45,02	+0,19		66.35.1,41	1,52	+0,11
	20.	0.	0.37,2		5.53.3,97	4,13	+0,16		66.32.49,30	49,51	+0,21
	21.	0.	0.50,5		5.57.13,90	13,68	-0,22		66.32.21,01	20,70	-0,31
	24.	0.	1.29,2		6.9.42,31	42,10	-0,21		66.33.24,43	22,98	-1,45
	25.	0.	1.41,9	II.	6.13.51,61	51,43	-0,18		66.34.32,77	33,27	+0,50
	28.	0.	2.19,4		6.26.18,97	18,68	-0,29		66.40.31,93	31,75	-0,18
July	3.	0.	3.17,7	II.	6.47.0,23	0,49	+0,26	N.	66.58.38,75	38,92	+0,17
	4.	0.	3.29,2		6.51.8,23	8,15	-0,08		67.3.27,65	29,11	+1,46
	6.	0.	3.50,5		6.59.22,75	22,57	-0,18		67.14.21,41	21,70	+0,29
	10.	0.	4.28,4	II.	7.15.47,00	47,41	+0,41		67.40.50,96	50,98	+0,02
	11.	0.	4.37,5		7.19.52,69	52,64	-0,05		67.48.26,13	26,47	+0,34
	13.	0.	4.53,5		7.28.1,89	1,77	-0,12		68.4.45,81	46,36	+0,55
	15.	0.	5.7,3		7.36.8,83	8,98	+0,15		68.22.36,57	36,34	-0,23
	16.	0.	5.13,9	II.	7.40.11,91	11,83	-0,08		68.32.4,85	4,64	-0,21
	17.	0.	5.19,7		7.44.14,34	14,17	-0,17		68.41.54,02	54,83	+0,81
	22.	0.	5.40,2		8.4.17,66	17,53	-0,13		69.36.25,10	26,00	+0,90
	24.	0.	5.44,2		8.12.14,82	14,88	+0,06	S.	70.0.38,55	39,19	+0,64
	26.	0.	5.46,3		8.20.10,01	9,87	-0,14		70.26.11,30	12,28	+0,98
	27.	0.	5.46,2		8.24.6,54	6,48	-0,06		70.39.27,92	28,08	+0,16
	31.	0.	5.40,5	I.	8.39.46,95	46,98	+0,03				
Aug.	2.	0.	5.34,3		8.47.33,91	33,72	-0,19		72.5.37,64	37,75	+0,11
	3.	0.	5.30,1		8.51.26,24	26,22	-0,02		72.21.1,15	2,74	+1,59
	5.	0.	5.20,5		8.59.9,70	9,46	-0,24		72.52.47,77	44,53	-3,24
	6.	0.	5.14,6		9.3.0,36	0,20	-0,16		73.8.59,35	60,73	+1,38
	13.	0.	4.17,4		9.29.38,94	39,10	+0,16		75.10.16,55	17,30	+0,75
	21.	0.	2.39,2	II.	9.59.32,88	32,90	+0,02		77.42.55,55	54,57	-0,98
	22.	0.	2.24,7	II.	10.3.14,93	14,82	-0,11		78.2.54,30	54,77	+0,47
	23.	0.	2.9,6						78.23.4,42	6,27	+1,85
	24.	0.	1.54,1	II.	10.10.37,32	37,30	-0,02		78.43.28,46	28,76	+0,30
	26.	0.	1.22,0		10.17.58,27	58,06	-0,21		79.24.45,17	45,56	+0,39
	27.	0.	1.5,0	I.	10.21.37,79	37,83	+0,04		79.45.38,71	39,36	+0,65
	29.	0.	0.30,5	II.	10.28.56,29	56,29	0,00		80.27.56,93	56,25	-0,68
Sept.	1.	23.	59.17,6		10.43.29,39	29,30	-0,09		81.54.19,40	18,44	-0,96
	5.	23.	58.0,1		10.57.57,91	57,97	+0,06		83.22.49,20	48,23	-0,97
	8.	23.	57.0,0		11.8.47,28	47,20	-0,08		84.30.20,48	20,93	+0,45
	9.	23.	56.39,6		11.12.23,40	23,25	-0,15		84.53.3,41	3,43	+0,02
	12.	23.	55.58,2						86.1.43,10	40,43	-2,67
	13.	23.	55.16,3		11.26.46,10	46,16	+0,06		86.24.43,31	41,52	-1,79
	17.	23.	54.13,2						87.57.20,54	20,42	-0,12
	18.	23.	53.30,9		11.44.43,14	43,17	+0,03		88.20.36,91	37,02	+0,11
	19.	23.	53.9,8		11.48.18,54	18,55	+0,01		88.43.56,58	55,72	-0,86
	22.	23.	52.6,8		11.59.5,08	5,05	-0,03		89.54.2,52	1,72	-0,80
	23.	23.	51.46,0		12.2.40,76	40,76	0,00		90.17.25,68	25,92	+0,24
	25.	23.	51.5,0		12.9.52,69	52,62	-0,07		91.4.15,04	15,72	+0,68
	26.	23.	50.44,6		12.13.28,77	28,83	+0,06		91.27.39,89	40,82	+0,93
	29.	23.	49.45,1	I.	12.24.18,83	18,83	0,00				
	30.	23.	49.25,6	II.	12.27.55,81	56,03	+0,22		93.1.14,72	13,92	-0,80
Oct.	1.	23.	49.6,6		12.31.33,29	33,52	+0,23		93.24.34,75	33,72	-1,03
	2.	23.	48.48,1		12.35.11,35	11,33	-0,02		93.47.51,64	51,32	-0,32
	6.	23.	47.36,9		12.49.46,18	46,09	-0,09		95.20.33,88	32,72	-1,16
	8.	23.	47.3,6	II.	12.57.5,90	5,83	-0,07		96.6.29,80	30,63	+0,83
	9.	23.	46.47,5		13.0.46,30	46,35	+0,05		96.29.20,65	22,43	+1,78
	10.	23.	46.31,9		13.4.27,17	27,33	+0,16		96.52.8,13	9,03	+0,90
	11.	23.	46.16,9		13.8.8,67	8,79	+0,12		97.14.49,06	50,03	+0,97
	13.	23.	45.48,3		13.15.33,18	33,16	-0,02		97.59.53,03	53,43	+0,40
	15.	23.	45.21,1		13.22.58,96	59,61	(+0,65)		98.44.29,59	29,64	+0,05
	16.	23.	45.9,2		13.26.43,64	43,65	+0,01		99.6.36,81	36,54	-0,27
	25.	23.	43.45,0		14.0.48,14	48,13	-0,01		102.18.57,34	57,56	+0,22
	29.	23.	43.25,8		14.16.15,08	15,27	+0,19		103.39.50,41	49,98	-0,43



Greenwich Mean Solar Time of Transit of Center.				Limb Observed.	R.A. of Center from Observation.			Seconds of Tabular R.A.	Error of Tables.	Limb Observed.	N.P.D. of Center from Observation.			Seconds of Tabular N.P.D.	Error of Tables.
d.	h.	m.	s.		h.	m.	s.	s.	s.		°	'	"	"	"
Nov.	3.	23.	43.20,0		14.	35.	52,11	52,10	-0,01		105.	16.	3,54	2,00	-1,54
	8.	23.	43.34,8		14.	55.	49,68	49,71	+0,03		106.	45.	59,05	58,22	-0,83
	10.	23.	43.46,4		15.	3.	54,51	54,62	+0,11		107.	18.	60,64	59,53	-1,11
	18.	23.	45.6,6	I.	15.	36.	47,27	47,48	+0,21	N.	109.	23.	34,07	34,37	+0,30
	19.	23.	45.20,4		15.	40.	57,67	57,80	+0,13		109.	37.	28,48	30,48	+2,00
	22.	23.	46.6,4		15.	53.	33,54	33,62	+0,08		110.	17.	8,36	9,60	+1,24
	24.	23.	46.40,9		16.	2.	1,26	1,48	+0,22		110.	41.	44,19	44,41	+0,22
	25.	23.	46.59,5		16.	6.	16,47	16,58	+0,11		110.	53.	23,58	27,42	+3,84
	26.	23.	47.18,9		16.	10.	32,46	32,44	-0,22		111.	4.	47,71	47,02	-0,69
Dec.	13.	23.	54.21,5		17.	24.	37,68	37,67	-0,01		113.	12.	46,36	46,94	+0,58
	15.	23.	55.19,3		17.	33.	28,72	28,87	+0,15		113.	19.	20,83	19,56	-1,27
	16.	23.	55.48,8		17.	37.	54,95	54,80	-0,15		113.	21.	53,36	53,97	+0,61
	20.	23.	57.47,5		17.	55.	40,16	40,11	-0,05		113.	27.	30,97	30,20	-0,77
	23.	23.	59.17,3	I.	18.	8.	59,95	59,87	-0,08		113.	26.	43,89	46,02	+2,13
	27.	0.	0.46,7		18.	22.	19,25	19,36	+0,11	S.	113.	21.	44,69	47,24	+2,55

RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF THE MOON.

Greenwich Mean Solar Time of Transit of Center.				Limb Observed.	R.A. of Center from Observation.			Seconds of Tabular R.A.	Error of Tables.	Limb Observed.	N.P.D. of Center from Observation.			Seconds of Tabular N.P.D.	Error of Tables.	Effect of increas- ing Para- allax $\frac{1}{1000}$	Effect of assuming the Earth Spherical.
d.	h.	m.	s.		h.	m.	s.	s.	s.		°	"	"	"	"	"	"
Jan.	22.	6.	3.23,1	I.	2.	9.	22,64	23,04	+ 0,40	S.	73.	28.	50,17	44,22	- 5,95	+ 2,09	+ 13,66
	24.	7.	52.48,9	I.	4.	6.	59,58	59,99	+ 0,41	S.	64.	14.	15,64	13,41	- 2,23	1,58	13,47
	29.	12.	34.51,3	II.	9.	9.	31,11	31,18	+ 0,07	N.	70.	1.	57,65	58,40	+ 0,75	1,79	12,97
Feb.	19.	4.	52.4,8	I.	2.	48.	16,17	16,92	+ 0,75	S.	69.	31.	61,45	50,46	- 10,99	1,90	13,74
	21.	6.	46.27,9	I.	4.	50.	51,21	51,87	+ 0,66	S.	62.	17.	26,44	22,27	- 4,17	1,47	13,33
	23.	8.	43.43,9	I.	6.	56.	19,55	20,44	+ 0,89	N.	62.	8.	1,19	2,64	+ 1,45	1,40	13,04
	25.	10.	29.45,9	I.	8.	50.	32,09	32,55	+ 0,46	N.	68.	22.	4,45	6,66	+ 2,21	1,70	12,92
	26.	11.	16.43,2	I.	9.	41.	33,73	33,90	+ 0,17								
	27.	12.	0.13,0	I.	10.	29.	7,16	7,56	+ 0,40	N.	78.	31.	37,58	38,27	+ 0,69	2,15	12,60
				II.	10.	29.	7,30	7,56	+ 0,26								
	28.	12.	41.12,0	II.	11.	14.	9,47	9,67	+ 0,20	S.	84.	18.	20,68	21,63	+ 0,95	2,40	12,25
Mar.	1.	13.	20.42,8	II.	11.	57.	43,29	43,37	+ 0,08	S.	90.	13.	20,89	21,30	+ 0,41	2,60	11,79
	9.	19.	33.59,1	II.	18.	43.	33,35	32,98	- 0,37								
	24.	8.	27.9,7	I.	8.	34.	2,79	3,48	+ 0,69	N.	67.	3.	34,90	38,89	+ 3,99	1,64	12,94
	25.	9.	14.54,0	I.	9.	25.	51,49	52,06	+ 0,57	N.	71.	30.	49,83	54,13	+ 4,30	1,84	12,83
	27.	10.	40.11,4	I.	10.	59.	15,97	16,20	+ 0,23	N.	82.	19.	43,46	45,13	+ 1,67	2,30	12,37
April	6.	18.	19.30,9	II.	19.	19.	16,42	16,36	- 0,06								
	17.	3.	25.57,2	I.	5.	6.	38,00	38,40	+ 0,40								
	19.	5.	27.51,5	I.	7.	16.	45,49	45,58	+ 0,09	N.	62.	51.	28,76	25,44	- 3,32	1,45	13,21
	20.	6.	22.39,1	I.	8.	15.	38,67	39,16	+ 0,49	N.	65.	52.	44,43	42,10	- 2,33	1,59	13,08
	21.	7.	12.25,8	I.	9.	9.	30,06	30,76	+ 0,70	N.	70.	4.	21,41	20,84	- 0,57	1,79	12,94
	22.	7.	57.47,8	I.	9.	58.	56,09	56,69	+ 0,60	N.	75.	4.	6,62	10,31	+ 3,69	2,00	12,75
	24.	9.	19.41,6	I.	11.	28.	56,47	56,77	+ 0,30	N.	86.	20.	27,51	32,07	+ 4,56	2,45	12,09
	25.	9.	58.36,2	I.	12.	11.	53,99	53,98	- 0,01	N.	92.	11.	12,43	14,59	+ 2,16	2,64	11,63
	27.	11.	17.53,3	I.	13.	39.	17,26	17,06	- 0,20	N.	103.	22.	55,93	57,16	+ 1,23	2,95	10,45
				I.	14.	25.	41,26	41,18	- 0,08								
	28.	12.	3.13,9	I.	14.	25.	41,32	41,18	- 0,14	S.	108.	20.	52,72	52,24	- 0,48	3,07	9,76
				II.	14.	25.	41,32	41,18	- 0,14								
	29.	12.	45.25,6	II.	15.	14.	56,99	56,88	- 0,11	S.	112.	35.	45,20	45,57	+ 0,37	3,14	9,18
May	6.	18.	50.13,6	II.	21.	48.	20,84	21,25	+ 0,41	N.	105.	57.	64,05	58,23	- 5,82	3,25	10,93
	17.	4.	12.18,0	I.	7.	51.	23,12	23,52	+ 0,40	N.	64.	37.	57,94	53,00	- 4,94	1,56	13,32
	21.	7.	18.26,1	I.	11.	13.	48,06	48,49	+ 0,43	N.	84.	30.	52,97	56,09	+ 3,12	2,39	12,28
	25.	9.	58.4,3	I.	14.	9.	38,64	38,56	- 0,08	N.	106.	47.	12,55	13,55	+ 1,00	3,03	10,04
	26.	10.	42.24,6	I.	14.	58.	2,79	2,60	- 0,19	N.	111.	16.	27,48	25,99	- 1,49	+ 3,12	+ 9,46
	27.	11.	30.3,0	I.	15.	49.	45,64	45,53	- 0,11								
	29.	13.	14.36,6	II.	17.	42.	29,51	29,49	- 0,02	S.	118.	24.	2,21	2,60	+ 0,39	+ 3,27	+ 8,42

RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF THE MOON, *continued.*

Greenwich Mean Solar Time of Transit of Center.				Limb Observed.	R.A. of Center from Observation.	Seconds of Tabular R.A.	Error of Tables.	Limb Observed.	N.P.D. of Center from Observation.	Seconds of Tabular N.P.D.	Error of Tables.	Effect of increasing Parallax $\frac{1}{1000}$	Effect of assuming the Earth Spherical.
d.	h.	m.	s.		h. m. s.	s.	s.		° ' "	"	"	"	"
June	5.19.9.10,2	II.	0.5.37,28	37,61	+0,33	N.	88.20.51,02	41,06	-9,96	2,76	13,09		
	16.4.31.34,9	I.	10.8.59,99	60,87	+0,88								
	17.5.14.24,2	I.	10.55.52,83	53,33	+0,50	N.	82.27.23,68	22,75	-0,93	2,34	12,54		
	19.6.34.11,4	I.	12.23.46,27	46,14	-0,13	N.	94.12.58,13	58,73	+0,60	2,72	11,52		
	24.10.14.29,8	I.	16.24.23,65	23,50	-0,15	S.	116.38.27,53	26,29	-1,24	3,24	8,65		
July	15.3.49.41,7	I.	11.21.20,06	20,60	+0,54	N.	86.3.25,74	27,90	+2,16	2,48	12,34		
	18.5.50.6,9	I.	13.33.54,72	54,51	-0,21	N.	103.18.37,98	35,17	-2,81	2,97	10,52		
	20.7.17.29,6	I.	15.9.24,88	24,90	+0,02								
	21.8.5.58,8	I.	16.1.58,61	58,65	+0,04	N.	115.46.35,02	33,93	-1,09	3,21	8,86		
	22.8.57.55,8	I.	16.58.0,65	0,77	+0,12	N & S.	117.51.2,61	4,04	+1,43	3,26	8,55		
Aug.	2.18.26.8,7	II.	3.11.9,03	9,91	+0,88	N.	67.17.31,87	26,50	-5,37	1,75	13,71		
	4.20.25.50,1	II.	5.19.3,22	3,85	+0,63								
	5.21.27.37,7	II.	6.24.57,59	58,20	+0,61								
	16.5.10.41,4	I.	14.48.42,86	42,64	-0,22								
	20.8.35.37,8	I.	18.29.59,14	59,01	-0,13	S.	118.12.22,92	24,19	+1,27	3,32	8,57		
	21.9.31.10,0	I.	19.29.37,04	37,03	-0,01	S.	116.16.13,44	15,10	+1,66	3,35	9,02		
	22.10.25.41,3	I.	20.28.13,90	13,97	+0,07	S.	112.44.23,27	26,79	+3,52	3,35	9,73		
	23.11.18.16,2	I.	21.24.53,99	54,61	+0,62	S.	107.48.11,20	12,34	+1,14	3,31	10,63		
	24.12.8.48,2	I.	22.19.31,96	31,49	-0,47*								
		II.	22.19.30,80	31,49	+0,69	N & S.	101.45.17,35	17,36	+0,01	3,20	11,63		
	25.12.57.50,6	II.	23.12.37,88	38,66	+0,78	N.	94.57.33,76	33,30	-0,46	3,01	12,54		
	31.18.19.47,3	II.	4.59.6,79	7,71	+0,92	N.	61.58.4,84	0,18	-4,66	1,44	13,47		
Sept.	13.3.50.48,5	I.	15.19.0,39	0,35	-0,04								
	15.5.30.15,0	I.	17.6.36,37	35,97	-0,40	N.	118.11.42,01	39,31	-2,70	3,24	8,45		
	18.8.11.59,0	I.	20.0.36,63	36,43	-0,20	S.	114.37.20,51	19,45	-1,06	3,33	9,30		
	19.9.4.44,0	I.	20.57.26,85	26,80	-0,05	S.	110.23.22,58	20,12	-2,46	3,32	10,13		
	21.10.45.41,1	I.	22.46.33,56	33,29	-0,27	S.	98.23.11,39	10,64	-0,75	3,14	12,11		
	22.11.35.2,7	I.	23.39.59,87	59,90	+0,03	N & S.	91.16.4,70	1,75	-2,95	2,92	13,03		
	23.12.25.6,5	II.	0.34.8,44	8,71	+0,27	N.	83.56.60,25	57,02	-3,23	2,63	13,68		
	29.18.15.33,3	II.	6.49.12,13	13,36	+1,23	N.	62.14.34,44	31,48	-2,96	1,44	13,33		
	30.19.12.47,0	II.	7.50.31,83	33,18	+1,35	S.	64.48.48,25	50,64	+2,39	1,59	13,25		
Oct.	2.20.53.22,1	II.	9.39.16,52	17,14	+0,62								
	14.5.8.24,1	I.	18.39.1,91	2,03	+0,12	N.	117.56.14,74	6,69	-8,05	3,26	8,56		
	15.6.1.13,8	I.	19.35.56,86	57,34	+0,48	S.	115.52.34,45	29,54	-4,91	3,28	8,92		
	16.6.52.59,4	I.	20.31.47,51	47,69	+0,18	S.	112.22.45,45	39,39	-6,06	3,29	9,62		
	18.8.32.17,8	I.	22.19.15,30	15,40	+0,10	S.	101.42.27,58	22,12	-5,46	3,18	11,51		
	19.9.20.49,8	I.	23.11.52,21	52,12	-0,09	S.	95.0.21,18	17,67	-3,51	3,03	12,48		
	20.10.10.0,6	I.	0.5.7,28	7,27	-0,01	S.	87.49.6,56	3,06	-3,50	2,81	13,32		
	24.13.56.42,3	II.	4.8.12,43	13,36	+0,93	N.	63.52.36,16	31,80	-4,36	1,60	14,02		
Nov.	11.3.55.23,3	I.	19.16.12,71	13,52	+0,81								
	16.7.57.10,4	I.	23.38.22,32	22,91	+0,59	S.	91.15.17,76	8,61	-9,15	2,88	12,76		
	18.9.37.8,3	I.	1.26.29,68	30,06	+0,38								
	20.11.33.58,6	I.	3.31.32,36	32,96	+0,60								
		II.	3.31.32,30	32,96	+0,66	N.	65.56.58,61	52,55	-6,06	1,74	14,20		
	21.12.39.14,0	II.	4.40.55,01	55,74	+0,73	N.	62.43.28,79	23,81	-4,98	1,54	14,06		
	22.13.46.6,7	II.	5.51.55,29	56,04	+0,75	N.	61.43.33,95	31,85	-2,10	1,47	13,88		
	29.19.38.29,2	II.	12.12.51,54	51,84	+0,30	S.	93.29.12,46	16,48	+4,02	2,73	11,60		
	30.20.18.20,3	II.	12.56.45,76	46,06	+0,30	S.	99.10.41,82	47,78	+5,96	2,88	10,95		
Dec.	12.5.6.1,0	I.	22.29.15,24	15,80	+0,56								
	13.5.51.12,6	I.	23.18.30,82	31,29	+0,47	S.	93.36.30,26	27,03	-3,23	2,90	12,27		
	14.6.37.3,3	I.	0.8.25,62	26,25	+0,63	S.	86.55.27,75	22,13	-5,62	2,69	13,01		
	16.8.16.40,9	I.	1.56.12,67	13,60	+0,93	S.	73.49.23,65	15,63	-8,02	2,15	13,93		
	20.12.28.1,4	II.	6.24.0,71	1,71	+1,00	N.	62.7.59,37	58,68	-0,69	1,49	13,88		
	27.18.15.41,9	I.	12.40.14,29	14,61	+0,32								
		II.	12.40.14,28	14,61	+0,33	S.	97.22.14,15	18,41	+4,26	2,85	11,24		
	28.18.56.28,0	II.	13.25.3,65	3,62	-0,03	S.	102.51.28,33	31,36	+3,03	2,97	10,54		
	29.19.38.39,6	II.	14.11.18,75	18,81	+0,06	S.	107.48.10,71	15,27	+4,56	+3,06	+9,85		

\* Evidently an error of 1" in the observation.



## RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF MERCURY.

Greenwich Mean Solar Time of Transit of Center.				Limb Observed.	R.A. of Center from Observation.			Seconds of Tabular R.A.	Error of Tables.	N.P.D. of Center from Observation.			Seconds of Tabular N.P.D.	Error of Tables.
d.	h.	m.	s.		h.	m.	s.	s.	s.	°	'	"	"	"
Jan.	15.22.36.41,3	II.	18.17.48,14	47,15	-0,99	110.41.20,25	19,26	-0,99						
	21.22.27.1,4	II.	18.31.45,97	45,34	-0,63	111.31.59,56	60,48	+0,92						
	28.22.29.22,8	II.	19.1.43,73	43,11	-0,62	112.8.30,81	33,16	+2,35						
	29.22.30.27,6					112.10.13,76	16,78	+3,02						
Feb.	14.23.0.46,2	II.	20.40.13,73	13,52	-0,21	109.58.58,22	63,20	+4,98						
	22.23.20.39,4	II.	21.31.42,61	42,29	-0,32	106.49.6,71	11,38	+4,67						
	27.23.33.56,0					104.6.32,39	34,99	+2,60						
Mar.	26.0.52.7,9	I.	1.5.39,37	39,29	-0,08	82.24.34,35	28,99	-5,36						
Apr.	11.1.7.42,0					72.30.11,13	8,33	-2,80						
May	17.22.27.5,2	II.	2.9.10,18	9,90	-0,28	80.32.25,86	33,82	+7,96						
	27.22.20.16,1					77.46.59,00	64,40	+5,40						
	28.22.20.44,0	II.	2.46.10,03	9,70	-0,33	77.22.9,40	12,31	+2,91						
	31.22.23.18,3	II.	3.0.34,48	34,37	-0,11	76.1.5,22	5,87	+0,65						
June	5.22.31.39,4	II.	3.28.39,75	39,42	-0,33	73.30.7,07	7,32	+0,25						
	9.22.42.9,7	II.	3.54.57,96	57,82	-0,14	71.22.59,00	58,32	-0,68						
	16.23.9.10,8	II.	4.49.39,45	39,61	+0,16	67.55.56,72	54,92	-1,80						
	17.23.13.54,4	II.	4.58.20,38	20,79	+0,41	67.30.51,01	48,70	-2,31						
	19.23.23.55,8	II.	5.16.16,54	16,95	+0,41	66.45.62,41	59,53	-2,88						
	20.23.29.11,0	II.	5.25.29,21	29,95	+0,74	66.26.43,02	40,10	-2,92						
July	4.0.40.35,6	I.	7.28.20,80	21,38	+0,58	66.15.58,19	58,73	+0,54						
	6.0.50.11,3	I.	7.45.51,19	51,60	+0,41	66.52.57,35	58,16	+0,81						
	13.1.17.59,2	I.	8.41.19,59	19,99	+0,40	69.57.40,35	40,99	+0,64						
	15.1.24.14,5	I.	8.55.28,97	29,26	+0,29	71.1.50,25	52,96	+2,71						
	17.1.29.46,1					72.9.24,75	26,64	+1,89						
Aug.	1.1.49.43,5	I.	10.28.3,67	3,51	-0,16									
	2.1.49.44,8	I.	10.32.1,49	1,48	-0,01	81.46.25,48	32,54	+7,06						
	5.1.48.46,7	I.	10.42.52,90	52,84	-0,06	83.26.41,62	45,97	+4,35						
	9.1.44.52,0	I.	10.54.43,81	43,81	0,00	85.27.49,44	55,94	+6,50						
Sept.	18.22.48.55,6	II.	10.39.57,21	57,36	+0,15	80.34.48,03	44,98	-3,05						
	19.22.49.31,5	II.	10.44.29,85	29,91	+0,06	80.49.57,23	55,02	-2,21						
	25.22.59.11,5					83.31.16,63	16,43	-0,20						
	26.23.1.26,8	II.	11.24.2,95	3,22	+0,27	84.7.25,63	26,59	+0,96						
	29.23.8.43,1	II.	11.43.10,06	10,29	+0,23	86.6.27,93	28,22	+0,29						
Oct.	2.23.16.18,3					88.16.19,99	21,07	+1,08						
	10.23.35.59,4					94.20.32,67	33,96	+1,29						
Nov.	4.0.28.41,2	I.	15.21.20,73	20,71	-0,02	109.46.5,24	9,52	+4,28						
	20.1.4.32,2					115.11.2,73	4,83	+2,10						

## RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF VENUS.

Jan.	8.0.28.30,4	I.	19.38.23,14	22,62	-0,52	112.33.42,61	46,08	+3,47
	9.0.29.57,1	I.	19.43.46,59	45,96	-0,63			
	10.0.31.22,6	I.	19.49.8,87	8,35	-0,52	112.10.47,16	49,90	+2,74
	16.0.39.34,6	I.	20.21.1,57	1,10	-0,47	110.46.10,76	11,36	+0,60
	24.0.49.24,1	I.	21.2.25,17	24,92	-0,25	108.19.23,54	24,34	+0,80
	30.0.55.52,3	I.	21.32.33,79	33,76	-0,03	106.7.9,12	8,38	-0,74
Feb.	2.0.58.49,3	I.	21.47.21,00	20,91	-0,09	104.54.48,96	49,80	+0,84
	16.1.10.20,8	I.	22.54.6,17	6,29	+0,12	98.34.40,86	39,78	-1,08
	21.1.13.44,2	I.	23.17.12,83	12,56	-0,27	96.6.25,69	24,09	-1,60
	26.1.16.50,5	I.	23.40.2,44	2,45	+0,01	93.34.13,04	10,30	-2,74
	28.1.18.1,7	I.	23.49.7,01	6,96	-0,05	92.32.33,79	31,20	-2,59

RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF VENUS, *continued.*

Greenwich Mean Solar Time of Transit of Center.				Limb Observed.	R.A. of Center from Observation.	Seconds of Tabular R.A.	Error of Tables.	N.P.D. of Center. from Observation.	Seconds of Tabular N.P.D.	Error of Tables.
d.	h.	m.	s.		h. m. s.	s.	s.	° ' "	"	"
Mar.	4.	1.20.20,1						90.28.31,30	27,21	-4,09
	8.	1.22.35,5		I.	0.25.13,97	14,03	+0,06	88.24.4,83	0,51	-4,32
	11.	1.24.17,0		I.	0.38.45,34	45,38	+0,04	86.50.55,76	53,61	-2,15
	25.	1.32.41,2		I.	1.42.22,75	22,76	+0,01	79.49.15,45	11,07	-4,38
	26.	1.33.20,9		I.	1.46.59,07	59,10	+0,03	79.20.29,90	26,07	-3,83
Apr.	10.	1.44.53,2		I.	2.57.41,57	41,72	+0,15	72.45.57,10	53,19	-3,91
	11.	1.45.46,9		I.	3.2.32,00	32,17	+0,17	72.22.39,58	34,98	-4,60
	17.	1.51.31,1		I.	3.31.56,46	56,76	+0,30	70.12.36,27	32,73	-3,54
	18.	1.52.32,4		I.	3.36.54,46	54,49	+0,03	69.52.39,76	36,72	-3,04
	19.	1.53.34,3		I.	3.41.53,13	53,23	+0,10	69.33.14,96	12,41	-2,55
	20.	1.54.37,3		I.	3.46.52,85	52,98	+0,13	69.14.23,52	20,20	-3,32
	22.	1.56.46,3		I.	3.56.55,30	55,39	+0,09	68.38.18,52	15,59	-2,93
	25.	2.0.6,7		I.	4.12.5,87	6,03	+0,16	67.48.30,63	26,96	-3,67
	26.	2.1.15,2		I.	4.17.11,16	11,35	+0,19	67.33.3,47	12,25	-1,22
	29.	2.4.45,9		I.	4.32.32,10	32,23	+0,13	66.50.30,85	28,72	-2,13
May	1.	2.7.10,2		I.	4.42.49,84	49,94	+0,10	66.25.17,22	16,20	-1,02
	2.	2.8.23,4						66.13.39,54	37,98	-1,56
	3.	2.9.37,0		I.	4.53.10,16	10,32	+0,16	66.2.39,80	39,07	-0,73
	4.	2.10.51,5		I.	4.58.21,45	21,40	-0,05	65.52.21,60	20,16	-1,44
	7.	2.14.37,2		I.	5.13.57,42	57,60	+0,18	65.25.26,30	25,83	-0,47
	14.	2.23.34,3		I.	5.50.31,92	32,30	+0,38	64.46.53,09	51,75	-1,34
	17.	2.27.25,0		I.	6.6.12,92	13,18	+0,26	64.40.53,25	54,22	+0,97
	18.	2.28.41,5		I.	6.11.26,22	26,34	+0,12	64.40.19,80	20,10	+0,30
	28.	2.40.54,9		I.	7.3.7,13	7,08	-0,05	65.13.12,16	13,79	+1,63
	29.	2.42.3,5		I.	7.8.12,51	12,66	+0,15	65.20.15,70	17,68	+1,98
	30.	2.43.11,4		I.	7.13.17,12	17,18	+0,06	65.27.59,85	61,37	+1,52
June	1.	2.45.23,6		I.	7.23.22,84	22,82	-0,02	65.45.25,30	26,75	+1,45
	6.	2.50.32,0		I.	7.48.14,86	14,96	+0,10	66.40.3,76	7,80	+4,04
	11.	2.55.4,9		I.	8.12.31,28	31,50	+0,22	67.49.47,19	51,75	+4,56
	17.	2.59.39,5		I.	8.40.45,99	45,96	-0,03	69.31.32,49	36,90	+4,41
	20.	3.1.32,9		I.	8.54.29,43	29,58	+0,15	70.29.6,01	10,28	+4,27
	24.	3.3.39,4		I.	9.12.22,48	22,12	-0,36			
	25.	3.4.6,3		I.	9.16.45,99	45,62	-0,37			
July	1.	3.6.7,9		I.	9.42.27,34	27,36	+0,02	74.32.0,53	6,31	+5,78
	3.	3.6.34,1		I.	9.50.46,66	46,34	-0,32	75.20.43,13	49,40	+6,27
	5.	3.6.52,5		I.	9.58.58,27	57,92	-0,35	76.10.35,07	42,29	+7,22
	6.	3.6.58,9		I.	10.3.1,27	0,96	-0,31	76.35.55,27	63,08	+7,81
	11.	3.7.4,0		I.	10.22.49,17	48,68	-0,49	78.46.16,48	22,97	+6,49
	13.	3.6.53,0		I.	10.30.31,23	30,95	-0,28	79.39.52,87	58,06	+5,19
	15.	3.6.34,8		I.	10.38.6,12	5,83	-0,29	80.34.8,25	14,15	+5,90
Aug.	1.	2.58.53,4		I.	11.37.24,96	24,47	-0,49	88.29.12,47	17,54	+5,07
	2.	2.58.8,3		I.	11.40.36,22	35,74	-0,48	88.57.11,24	18,14	+6,90
	3.	2.57.20,9		I.	11.43.45,25	44,87	-0,38	89.25.6,87	14,64	+7,77
	5.	2.55.40,0		I.	11.49.57,20	56,50	-0,70	90.20.49,07	53,25	+4,18
	7.	2.53.49,5		I.	11.55.59,53	58,99	-0,54			
	9.	2.51.49,5		I.	12.1.52,27	51,86	-0,41			
	10.	2.50.45,8		I.	12.4.44,99	44,53	-0,46			
	22.	2.34.10,8		I.	12.35.25,89	25,13	-0,76	97.45.55,28	57,51	+2,23
	29.	2.20.18,3		I.	12.49.7,06	6,67	-0,39	100.22.44,65	44,26	-0,39
Sept.	2.	2.10.33,5		I.	12.55.6,88	6,35	-0,53	101.41.15,68	14,20	-1,48
	9.	1.49.32,9		I.	13.1.38,64	38,05	-0,59	103.32.40,84	36,69	-4,15
	10.	1.46.4,7		I.	13.2.6,45	5,89	-0,56	103.45.21,16	14,90	-6,26
	16.	1.22.29,8		I.	13.2.7,01	6,39	-0,62	104.39.45,13	36,51	-8,62
	18.	1.13.31,9		I.	13.1.0,75	0,19	-0,56	104.48.35,30	25,75	-9,55
	23.	0.48.43,4		I.	12.55.50,94	50,42	-0,52	104.46.66,99	51,06	-15,93
	25.	0.37.54,8		I.	12.52.53,69	53,18	-0,51	104.36.24,40	7,91	-16,49
	30.	0.9.10,8		I.	12.43.47,69	47,02	-0,67	103.43.63,44	43,83	-19,61
Oct.	3.	23.45.9,1						102.56.25,19	1,99	-23,20
	10.	23.3.41,6		II.	12.21.29,87	29,02	-0,85	100.8.44,08	19,37	-24,71



RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF VENUS, *continued.*

Greenwich Mean Solar Time of Transit of Center.				Limb Observed.	R.A. of Center from Observation.	Seconds of Tabular R.A.	Error of Tables.	N.P.D. of Center from Observation.	Seconds of Tabular N.P.D.	Error of Tables.
d.	h.	m.	s.		h.	m.	s.	°	'	"
Oct.	11.	22.	58. 2,2	II.	12. 19. 46,06	45,40	-0,66	99. 45. 44,94	19,68	-25,26
	13.	22.	47. 2,7	II.	12. 16. 37,88	37,09	-0,79	98. 59. 49,16	23,47	-25,69
	15.	22.	36. 31,5	II.	12. 13. 58,20	57,43	-0,77	98. 14. 48,04	21,26	-26,78
	16.	22.	31. 28,1	II.	12. 12. 50,44	49,45	-0,99	97. 52. 54,26	27,65	-26,61
	25.	21.	52. 26,7	II.	12. 9. 11,56	11,00	-0,56	95. 9. 71,96	47,42	-24,54
	27.	21.	45. 23,8	II.	12. 10. 0,65	0,19	-0,46	94. 44. 54,44	28,39	-26,05
Nov.	19.	20.	57. 13,0	II.	12. 52. 22,72	22,41	-0,31	94. 41. 61,33	48,55	-12,78
	21.	20.	55. 6,6	II.	12. 58. 9,08	8,63	-0,45	95. 1. 61,04	48,53	-12,51
	22.	20.	54. 8,8	II.	13. 1. 7,65	7,10	-0,55	95. 12. 53,20	41,72	-11,48
	26.	20.	50. 49,9	II.	13. 13. 34,50	33,97	-0,53	96. 1. 44,64	35,38	-9,26
	29.	20.	48. 52,5	II.	13. 23. 26,42	25,88	-0,54	96. 43. 21,34	10,86	-10,48
Dec.	3.	20.	46. 53,5	II.	13. 37. 13,34	12,69	-0,65	97. 43. 63,60	57,34	-6,26
	12.	20.	44. 40,4					100. 16. 7,65	1,91	-5,74
	15.	20.	44. 34,3	II.	14. 22. 12,37	11,62	-0,75			
	20.	20.	45. 1,0	II.	14. 42. 21,99	21,27	-0,72			
	22.	20.	45. 24,8	II.	14. 50. 38,97	38,19	-0,78	103. 15. 35,91	34,21	-1,70
	25.	20.	46. 13,8	II.	15. 3. 17,76	17,12	-0,64			
	27.	20.	46. 55,4	II.	15. 11. 52,63	51,92	-0,71	104. 44. 3,34	3,92	+0,58
	29.	20.	47. 43,8	II.	15. 20. 34,28	33,62	-0,66	105. 18. 30,60	31,52	+0,92

## RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF MARS.

Feb.	23.	13.	41. 6,9	II.	11. 54. 31,44	31,49	+0,05	85. 6. 10,71	9,12	-1,59
	25.	13.	31. 4,2	II.	11. 52. 20,19	20,23	+0,04	84. 51. 2,88	3,13	+0,25
	26.	13.	25. 59,5	II.	11. 51. 11,22	11,14	-0,08	84. 43. 15,39	15,63	+0,24
	27.	13.	20. 52,5	II.	11. 49. 59,97	59,88	-0,09	84. 35. 21,73	19,43	-2,30
	28.	13.	15. 43,5	II.	11. 48. 46,66	46,53	-0,13	84. 27. 16,44	15,43	-1,01
Mar.	1.	13.	10. 32,5	II.	11. 47. 31,32	31,21	-0,11	84. 19. 6,13	4,43	-1,70
	6.	12.	44. 11,8	II.	11. 40. 49,04	48,88	-0,16	83. 36. 58,96	56,94	-2,02
	8.	12.	33. 29,9	II.	11. 37. 58,54	58,41	-0,13	83. 19. 51,05	49,74	-1,31
	9.	12.	28. 7,4		11. 36. 31,71	31,71	0,00	83. 11. 16,59	16,84	+0,25
	11.	12.	17. 20,6		11. 33. 36,27	36,21	-0,06	82. 54. 19,45	17,94	-1,51
	13.	12.	6. 32,0		11. 30. 38,94	38,98	+0,04	82. 37. 35,83	35,64	-0,19
	19.	11.	34. 9,8		11. 21. 50,83	50,81	-0,02	81. 50. 32,43	32,52	+0,09
	27.	10.	51. 57,3		11. 11. 3,83	3,65	-0,18	80. 59. 21,16	23,99	+2,83
Apr.	1.	10.	26. 34,8	I.	11. 5. 19,89	20,04	+0,15			
	6.	10.	2. 13,8	I.	11. 0. 37,67	37,57	-0,10	80. 20. 37,35	39,04	+1,69
	11.	9.	39. 1,2	I.	10. 57. 4,07	3,84	-0,23			
	16.	9.	17. 1,1	I.	10. 54. 43,11	43,06	-0,05			
	19.	9.	4. 24,4					80. 16. 7,38	11,07	+3,69
	25.	8.	40. 28,7	I.	10. 53. 33,69	33,32	-0,37	80. 30. 41,23	43,85	+2,62
	27.	8.	32. 52,0	I.	10. 53. 48,81	48,40	-0,41			
	29.	8.	25. 25,6	I.	10. 54. 14,28	13,94	-0,34	80. 45. 30,48	35,93	+5,45
	30.	8.	21. 46,3	I.	10. 54. 30,93	30,56	-0,37	80. 49. 51,39	55,03	+3,64
May	3.	8.	11. 3,0	I.	10. 55. 35,56	35,19	-0,37	81. 4. 11,45	15,22	+3,77
	7.	7.	57. 18,4	I.	10. 57. 34,96	34,48	-0,48	81. 26. 22,27	26,40	+4,13
	8.	7.	53. 57,7	I.	10. 58. 10,30	9,96	-0,34	81. 32. 27,35	30,70	+3,35
	10.	7.	47. 23,2	I.	10. 59. 27,82	27,45	-0,37	81. 45. 13,05	15,79	+2,74
	11.	7.	44. 9,2	I.	11. 0. 9,77	9,38	-0,39	81. 51. 53,78	56,29	+2,51
	17.	7.	25. 26,7	I.	11. 5. 3,58	3,18	-0,40	82. 35. 54,17	58,57	+4,40
	18.	7.	22. 26,3	I.	11. 5. 59,21	58,80	-0,41			
	20.	7.	16. 30,8	I.	11. 7. 55,90	55,39	-0,51			
	21.	7.	13. 35,5	I.	11. 8. 56,72	56,28	-0,44			
	25.	7.	2. 11,1	I.	11. 13. 16,57	16,12	-0,45			
	27.	6.	56. 38,0	I.	11. 15. 35,69	35,33	-0,36	84. 2. 52,86	56,05	+3,19
	28.	6.	53. 53,8	I.	11. 16. 47,59	47,13	-0,46	84. 12. 23,77	27,54	+3,77
	29.	6.	51. 10,9	I.	11. 18. 0,82	0,35	-0,47	84. 22. 1,95	7,44	+5,49
	30.	6.	48. 29,6	I.	11. 19. 15,70	14,97	-0,73	84. 31. 52,14	55,54	+3,40

RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF MARS, *continued.*

Greenwich Mean Solar Time of Transit of Center.				Limb Observed.	R.A. of Center from Observation.			Seconds of Tabular R.A.	Error of Tables.	N.P.D. of Center from Observation.			Seconds of Tabular N.P.D.	Error of Tables.
d.	h.	m.	s.		h.	m.	s.	s.	s.	°	'	"	"	"
June	1.	6.43.	10,6	I.	11.21.	48,93		48,30	-0,63	84.51.	53,01		55,84	+2,83
	5.	6.32.	48,2	I.	11.27.	11,03		10,53	-0,50	85.33.	25,39		29,23	+3,84
	6.	6.30.	15,2							85.44.	7,06		11,32	+4,26
	10.	6.20.	17,8	I.	11.34.	21,34		20,82	-0,52	86.28.	5,70		11,02	+5,32
	12.	6.15.	25,2	I.	11.37.	21,11		20,98	-0,13	86.50.	46,28		52,31	+6,03
	17.	6.3.	33,8	I.	11.45.	10,58		10,10	-0,48	87.49.	23,88		27,00	+3,12
	24.	5.47.	38,4	I.	11.56.	48,45		47,86	-0,59	89.15.	23,89		27,99	+4,10
July	4.	5.26.	6,2	I.	12.14.	38,23		38,13	-0,10	91.25.	1,67		5,98	+4,31
	5.	5.24.	1,8	I.	12.16.	30,03		29,59	-0,44	91.38.	21,98		26,38	+4,40
	6.	5.21.	57,9	I.	12.18.	22,41		21,84	-0,57					
	11.	5.11.	49,6	I.	12.27.	55,23		54,66	-0,57	92.59.	39,44		43,88	+4,44
	15.	5.3.	56,4	I.	12.35.	46,96		46,44	-0,52	93.54.	53,71		57,97	+4,26
Aug.	1.	4.32.	31,2	I.	13.11.	18,12		17,51	-0,61	97.55.	19,41		22,57	+3,16
	2.	4.30.	46,4	I.	13.13.	29,52		29,06	-0,46	98.9.	34,39		39,67	+5,28
	3.	4.29.	2,6	I.	13.15.	42,04		41,32	-0,72					
	5.	4.25.	36,0							98.52.	27,80		31,67	+3,87
	10.	4.17.	13,8	I.	13.31.	27,24		26,82	-0,42	100.3.	49,37		53,27	+3,90
	17.	4.6.	0,1	I.	13.47.	47,55		46,99	-0,56					

## RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF VESTA.

Greenwich Mean Solar Time of Transit.	R.A. from Observation.	Seconds of Tabular R.A.	Error of Tables.	N.P.D. from Observation.	Seconds of Tabular N.P.D.	Error of Tables.
d. h. m. s.	h. m. s.	s.	s.	° ' "	"	"
Jan. 9. 11. 4. 5,7	6. 19. 39,36	39,37	+ 0,01	67. 16. 3,03	21,35	+ 18,32
15. 10. 34. 30,0	6. 13. 38,17	38,24	+ 0,07	66. 56. 26,95	46,05	+ 19,10
19. 10. 15. 11,1	6. 10. 2,38	2,16	- 0,22	66. 44. 11,69	30,25	+ 18,56
22. 10. 0. 57,1	6. 7. 35,71	35,85	+ 0,14	66. 35. 25,52	44,05	+ 18,53
Feb. 14. 8. 20. 56,9	5. 57. 59,85			65. 38. 51,71		
15. 8. 16. 59,6	5. 57. 58,44			65. 36. 46,57		
16. 8. 13. 4,0	5. 57. 58,79			65. 34. 42,54		
18. 8. 5. 18,9	5. 58. 5,47			65. 30. 39,15		
19. 8. 1. 29,1	5. 58. 11,61			65. 28. 40,28		
20. 7. 57. 41,2	5. 58. 19,65			65. 26. 42,62		
25. 7. 39. 10,3	5. 59. 28,64			65. 17. 16,36		
27. 7. 31. 58,9	6. 0. 9,03			65. 13. 41,19		
Mar. 8. 7. 1. 0,3	6. 4. 34,36			64. 59. 5,14		

## RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF JUNO.

Sept.	19.	13.43.	30,2	1.36.	58,84	60,48	+1,64	88.35.	21,05	0,70	-20,35
	21.	13.35.	8,0	1.36.	28,31	29,66	+1,35	89.0.	45,39	27,89	-17,50
	23.	13.26.	39,5	1.35.	51,49	52,80	+1,31				
	26.	13.13.	45,5	1.34.	45,10	46,68	+1,58	90.6.	53,48	35,48	-18,00
	27.	13.9.	24,7	1.34.	20,13	21,90	+1,77	90.20.	26,55	9,38	-17,17
	28.	13.5.	2,8	1.33.	54,03	55,82	+1,79	90.33.	64,01	48,28	-15,73
	30.	12.56.	14,6	1.32.	57,56	59,93	+2,37	91.1.	34,64	18,27	-16,37
Oct.	2.	12.47.	23,0	1.31.	57,57	59,40	+1,83	91.28.	76,07	58,77	-17,30
	11.	12.6.	44,5	1.26.	41,38	43,16	+1,78	93.32.	42,70	24,88	-17,82
	14.	11.53.	1,9	1.24.	46,24	48,05	+1,81	94.11.	64,49	49,39	-15,10



RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF JUNO, *continued.*

Greenwich Mean Solar Time of Transit.	R.A. from Observation.	Seconds of Tabular R.A.	Error of Tables.	N.P.D. from Observation.	Seconds of Tabular N.P.D.	Error of Tables.
d. h. m. s.	h. m. s.	s.	s.	° ' "	"	"
Oct. 15. 11. 48. 27,2	1. 24. 7,32	9,29	+ 1,97	94. 24. 53,89	37,89	- 16,00
16. 11. 43. 52,7	1. 23. 28,66	30,47	+ 1,81	94. 37. 30,12	15,20	- 14,92
19. 11. 30. 9,2	1. 21. 32,51	34,38	+ 1,87	95. 13. 64,58	51,31	- 13,27
26. 10. 58. 21,3	1. 17. 15,25	15,69	+ 0,44*	96. 30. 32,27	20,54	- 11,73
28. 10. 49. 20,0	1. 16. 5,59	7,54	+ 1,95	96. 49. 42,61	30,95	- 11,66

\* Probably an error of 1<sup>s</sup> in the observation. See the Transit as observed.

## RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF PALLAS.

Mar. 27. 12. 55. 44,3	13. 15. 11,12	33,91	+ 22,79	76. 59. 17,81	22,44	+ 4,63
Apr. 6. 12. 9. 7,0	13. 7. 51,68	74,58	+ 22,90	73. 46. 58,91	60,09	+ 1,18
17. 11. 17. 58,2	12. 59. 56,61	78,94	+ 22,33	70. 56. 35,64	31,42	- 4,22
19. 11. 8. 47,7				70. 30. 60,35	55,80	- 4,55
20. 11. 4. 13,7	12. 57. 59,49	81,18	+ 21,69			
25. 10. 41. 36,6	12. 55. 1,46	23,02	+ 21,56	69. 24. 38,19	28,26	- 9,93
29. 10. 23. 50,3	12. 52. 58,44	79,54	+ 21,10	68. 48. 48,13	38,13	- 10,00
30. 10. 19. 26,4	12. 52. 30,35	51,58	+ 21,23	68. 40. 53,57	42,53	- 11,04
May 3. 10. 6. 23,0	12. 51. 14,54			68. 19. 34,32		
7. 9. 49. 16,1	12. 49. 51,03			67. 56. 33,32		
17. 9. 8. 4,6	12. 47. 58,38			67. 24. 5,07		
21. 8. 52. 15,0	12. 47. 52,39			67. 20. 2,83		
25. 8. 36. 48,1	12. 48. 9,09			67. 20. 30,05		
27. 8. 29. 12,6	12. 48. 25,55					

## RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF CERES.

Mar. 27. 13. 12. 28,9	13. 31. 58,51	56,99	- 1,52	82. 46. 58,96	38,08	- 20,88
Apr. 6. 12. 24. 54,0	13. 23. 41,25	39,74	- 1,51	82. 5. 81,99	58,95	- 23,04
17. 11. 32. 8,8	13. 14. 9,47	8,05	- 1,42	81. 38. 68,26	46,92	- 21,34
19. 11. 22. 35,4				81. 36. 37,43	16,82	- 20,61
20. 11. 17. 52,0	13. 11. 40,02	38,36	- 1,66			
25. 10. 54. 16,9	13. 7. 43,83	42,24	- 1,59	81. 33. 63,24	40,80	- 22,44
29. 10. 35. 40,4	13. 4. 50,46	48,84	- 1,62	81. 36. 26,02	4,88	- 21,14
30. 10. 31. 3,3	13. 4. 9,23	7,98	- 1,25	81. 37. 34,36	11,68	- 22,68
May 3. 10. 17. 20,1	13. 2. 13,44	11,95	- 1,49	81. 41. 67,57	45,77	- 21,80
7. 9. 59. 18,7	12. 59. 55,27			81. 51. 1,87		
17. 9. 15. 47,7	12. 55. 42,66					
20. 9. 3. 11,6	12. 54. 54,22			82. 40. 44,82		
21. 8. 59. 2,3	12. 54. 40,80			82. 45. 46,29		
25. 8. 42. 40,8	12. 54. 2,80			83. 7. 28,44		

## RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF JUPITER.

Greenwich Mean Solar Time of Transit of Center.	R.A. of Center from Observation.	Seconds of Tabular R.A.	Error of Tables.	N.P.D. of Center from Observation.	Seconds of Tabular N.P.D.	Error of Tables.
d. h. m. s.	h. m. s.	s.	s.	° ' "	"	"
Mar. 9. 13. 55. 48,1	13. 4. 26,84	26,12	-0,72	95. 10. 9,81	11,64	+1,83
11. 13. 47. 11,3	13. 3. 41,73	41,09	-0,64	95. 5. 13,70	13,34	-0,36
13. 13. 38. 32,8	13. 2. 54,92	54,26	-0,66	95. 0. 5,35	5,14	-0,21
19. 13. 12. 28,0	13. 0. 25,14	24,42	-0,72	94. 43. 48,62	49,35	+0,73
20. 13. 8. 5,9	12. 59. 58,83	58,28	-0,55	94. 41. 1,32	0,45	-0,87
21. 13. 3. 43,5	12. 59. 32,35	31,85	-0,50	94. 38. 10,25	10,15	-0,10
27. 12. 37. 25,5	12. 56. 49,35	48,42	-0,93	94. 20. 45,44	44,05	-1,39
Apr. 5. 11. 57. 48,6	12. 52. 34,88	34,21	-0,67	93. 53. 61,49	59,75	-1,74
6. 11. 53. 24,4	12. 52. 6,53	5,80	-0,73	93. 51. 1,94	1,95	+0,01
11. 11. 31. 23,9	12. 49. 45,13	44,75	-0,38	93. 36. 26,49	24,85	-1,64
17. 11. 5. 4,8	12. 47. 1,07	0,31	-0,76	93. 19. 34,77	32,94	-1,83
19. 10. 56. 20,1	12. 46. 8,09	7,36	-0,73	93. 14. 11,25	10,24	-1,01
20. 10. 51. 58,5	12. 45. 42,27	41,31	-0,96			
25. 10. 30. 14,0	12. 43. 36,94	35,99	-0,95	92. 58. 56,97	57,14	+0,17
29. 11. 12. 57,1	12. 42. 3,42	2,56	-0,86	92. 49. 40,76	41,64	+0,88
30. 10. 8. 38,7	12. 41. 40,95	40,28	-0,67	92. 47. 30,70	30,24	-0,46
May 3. 9. 55. 47,3	12. 40. 37,07	36,18	-0,89	92. 41. 15,98	15,33	-0,65
7. 9. 38. 45,1	12. 39. 18,27	17,59	-0,68	92. 33. 44,05	42,73	-1,32
17. 8. 56. 48,6	12. 36. 40,45	39,75	-0,70	92. 19. 12,76	13,82	+1,06
21. 8. 40. 18,8	12. 35. 54,24	53,53	-0,71	92. 15. 18,49	19,61	+1,12
22. 8. 36. 13,1	12. 35. 44,37	43,55	-0,82	92. 14. 32,80	31,61	-1,19
25. 8. 23. 59,3	12. 35. 18,22	17,47	-0,75	92. 12. 33,68	32,61	-1,07
27. 8. 15. 53,4	12. 35. 4,10	3,32	-0,78	92. 11. 35,07	34,81	-0,56
28. 8. 11. 51,5	12. 34. 58,09	57,22	-0,87	92. 11. 12,34	12,31	-0,03
29. 8. 7. 50,1	12. 34. 52,65	51,78	-0,87	92. 10. 53,99	54,00	+0,01
June 1. 7. 55. 49,7	12. 34. 39,93	39,37	-0,56	92. 10. 25,84	24,90	-0,94
4. 7. 43. 55,2	12. 34. 33,18	32,84	-0,34	92. 10. 34,50	34,00	-0,50
10. 7. 20. 24,9	12. 34. 38,28	37,55	-0,73	92. 12. 46,71	47,09	+0,38
12. 7. 12. 39,5	12. 34. 44,79	44,40	-0,39	92. 14. 4,89	5,69	+0,80
17. 6. 53. 28,7	12. 35. 13,59	12,87	-0,72	92. 18. 34,43	34,48	+0,05
19. 6. 45. 52,4	12. 35. 29,21	28,74	-0,47	92. 20. 50,66	50,48	-0,18
22. 6. 34. 33,5	12. 35. 58,08	57,27	-0,81	92. 24. 45,18	44,48	-0,70
24. 6. 27. 3,6	12. 36. 20,09	19,36	-0,73	92. 27. 40,37	39,88	-0,49
25. 6. 23. 19,3	12. 36. 31,75	31,33	-0,42	92. 29. 14,45	13,37	-1,08
July 4. 5. 50. 10,2	12. 38. 46,25	45,61	-0,64	92. 45. 59,70	60,87	+1,17
11. 5. 24. 54,5	12. 41. 2,28	1,87	-0,41	93. 2. 19,36	21,06	+1,70
13. 5. 17. 46,6	12. 41. 46,37	45,67	-0,70	93. 7. 31,76	30,86	-0,90
15. 5. 10. 40,5	12. 42. 32,18	31,54	-0,64	93. 12. 52,83	53,36	+0,53
25. 4. 35. 39,7	12. 46. 51,23	50,59	-0,64			
Aug. 1. 4. 11. 36,2	12. 50. 19,64	19,14	-0,50			
2. 4. 8. 11,7	12. 50. 51,11	50,65	-0,46	94. 9. 44,53	45,94	+1,41
3. 4. 4. 47,9	12. 51. 23,32	22,58	-0,74	94. 13. 20,74	19,74	-1,00
Dec. 12. 21. 5. 5,4	14. 30. 57,21	56,83	-0,38	103. 45. 35,83	37,54	+1,71
20. 20. 39. 24,4	14. 36. 44,50	43,90	-0,60			
22. 20. 32. 56,3	14. 38. 8,42	7,75	-0,67	104. 18. 55,87	58,15	+2,28
27. 20. 16. 39,4				104. 34. 15,49	17,85	+2,36

## RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF SATURN.

Feb. 12. 19. 0. 46,7	16. 31. 41,63	41,32	-0,31	110. 3. 44,85	64,99	+20,14
14. 18. 53. 22,9	16. 32. 9,70	9,27	-0,43	110. 4. 34,17	49,49	+15,32
24. 18. 16. 0,4	16. 34. 6,63	6,13	-0,50	110. 7. 20,82	36,80	+15,98
25. 18. 12. 14,0	16. 34. 16,24	15,66	-0,58	110. 7. 33,40	48,60	+15,20
May 3. 13. 44. 12,2	16. 29. 39,47	38,75	-0,72	109. 50. 23,70	40,21	+16,51
6. 13. 31. 36,3	16. 28. 51,24	50,74	-0,50	109. 48. 33,65	49,31	+15,66



RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF SATURN, *continued.*

Greenwich Mean Solar Time of Transit of Center.				R.A. of Center from Observation.		Seconds of Tabular R.A.	Error of Tables.	N.P.D. of Center Observation.			Seconds of Tabular N.P.D.	Error of Tables.	
d.	h.	m.	s.	h.	m.	s.	s.	s.	°	'	"	"	"
May	14.	12.	57.53,2	16.	26.	35,03	34,37	-0,66	109.	43.	22,98	39,61	+16,63
	15.	12.	53.39,5	16.	26.	17,15	16,64	-0,51					
	16.	12.	49.25,9	16.	25.	59,45	58,78	-0,67	109.	42.	1,65	19,91	+18,26
	17.	12.	45.12,2	16.	25.	41,64	40,83	-0,81	109.	41.	21,42	39,91	+18,49
	21.	12.	28.15,9	16.	24.	28,76	28,01	-0,75	109.	38.	42,35	58,71	+16,36
	25.	12.	11.18,6	16.	23.	14,93	14,14	-0,79	109.	36.	0,77	16,51	+15,74
	27.	12.	2.49,7	16.	22.	37,70	37,00	-0,70	109.	34.	39,02	55,71	+16,69
	29.	11.	54.20,9	16.	21.	60,64	59,83	-0,81	109.	33.	19,62	35,11	+15,49
June	1.	11.	41.37,5	16.	21.	4,85	4,14	-0,71	109.	31.	19,06	35,21	+16,15
	4.	11.	28.54,2	16.	20.	9,12	8,73	-0,39	109.	29.	20,04	36,91	+16,87
	8.	11.	11.58,1	16.	18.	56,41	55,74	-0,67	109.	26.	46,80	62,51	+15,71
	12.	10.	55.3,2	16.	17.	45,02	44,35	-0,67					
	15.	10.	42.23,4	16.	16.	52,85	52,21	-0,64	109.	22.	28,17	46,71	+18,54
	19.	10.	25.32,8	16.	15.	45,72	44,99	-0,73	109.	20.	15,49	31,21	+15,72
	24.	10.	4.34,2	16.	14.	26,40	25,39	-1,01	109.	17.	40,18	55,01	+14,83
July	1.	9.	35.21,1	16.	12.	44,50	43,85	-0,65	109.	14.	30,48	45,31	+14,83
	3.	9.	27.3,0	16.	12.	18,08	17,20	-0,88					
	4.	9.	22.54,0	16.	12.	4,99	4,30	-0,69	109.	13.	19,25	35,61	+16,36
	5.	9.	18.44,9						109.	12.	58,40	74,11	+15,71
	6.	9.	14.37,5	16.	11.	40,20	39,42	-0,78	109.	12.	37,57	53,41	+15,84
	15.	8.	37.38,3	16.	10.	3,97	3,24	-0,73					
	18.	8.	25.24,7	16.	9.	38,05	37,32	-0,73	109.	9.	45,78	59,30	+13,52
	20.	8.	17.17,6	16.	9.	22,67	21,85	-0,82					
	22.	8.	9.11,6	16.	9.	8,50	7,88	-0,62	109.	9.	16,60	33,40	+16,80
	24.	8.	1.7,4	16.	8.	56,05	55,40	-0,65					
Aug.	2.	7.	25.7,0	16.	8.	18,76	18,02	-0,74	109.	9.	34,22	50,10	+15,88
	8.	7.	1.24,4	16.	8.	11,67	10,84	-0,83					

## RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF URANUS.

Aug.	20.	13.	11.22,7	23.	6.	29,40	34,50	+5,10	96.36.52,14	30,99	-21,15
	21.	13.	7.18,3	23.	6.	20,85	26,18	+5,33	96.37.43,61	23,89	-19,72
	22.	13.	3.14,3	23.	6.	12,77	17,80	+5,03	96.38.38,06	17,09	-20,97
	23.	12.	59.9,8	23.	6.	4,13	9,36	+5,23	96.39.30,10	10,59	-19,51
	24.	12.	55.6,0	23.	5.	56,21	60,86	+4,65	96.40.25,95	4,39	-21,56
	25.	12.	51.1,0	23.	5.	47,13	52,31	+5,18			
	27.	12.	42.52,0	23.	5.	29,94	35,08	+5,14	96.42.67,89	47,29	-20,60
	29.	12.	34.42,8	23.	5.	12,47	17,68	+5,21	96.44.58,20	36,89	-21,31
Sept.	4.	12.	10.14,8	23.	4.	19,75	24,77	+5,02	96.50.29,28	8,89	-20,39
	6.	12.	2.5,2	23.	4.	1,93	6,99	+5,06	96.51.80,32	59,98	-20,34
	9.	11.	49.50,9	23.	3.	35,25	40,28	+5,03	96.54.66,96	46,38	-20,58
	12.	11.	37.36,3	23.	3.	8,34	13,63	+5,29	96.57.52,47	31,68	-20,79
	13.	11.	33.31,7	23.	2.	59,65	64,78	+5,13	96.58.47,22	26,38	-20,84
	19.	11.	9.3,9	23.	2.	7,13	12,29	+5,16	97.3.70,21	50,39	-19,82
	21.	11.	0.54,8	23.	1.	49,84	55,09	+5,25	97.5.55,24	35,79	-19,45
	23.	10.	52.46,3	23.	1.	33,03	38,09	+5,06	97.7.39,88	19,79	-20,09
	26.	10.	40.33,6	23.	1.	7,97	13,04	+5,07			
	28.	10.	32.25,3	23.	0.	51,46	56,67	+5,21	97.11.50,93	32,29	-18,64
	30.	10.	24.17,6	23.	0.	35,54	40,61	+5,07	97.13.28,88	9,69	-19,19
Oct.	1.	10.	20.13,8	23.	0.	27,61	32,70	+5,09	97.13.76,41	57,59	-18,82
	2.	10.	16.10,0	23.	0.	19,79	24,88	+5,09			
	7.	9.	55.52,8	22.	59.	42,00	47,11	+5,11	97.18.51,73	32,39	-19,34
	10.	9.	43.43,7	22.	59.	20,56	25,69	+5,13			
	14.	9.	27.34,2	22.	58.	54,55	58,77	+4,22*	97.23.40,48	20,19	-20,29

\* Probably an error of 1<sup>s</sup> in the observation.

RIGHT ASCENSIONS AND NORTH POLAR DISTANCES OF URANUS, *continued*.

Greenwich Mean Solar Time of Transit of Center.	R.A. of Center from Observation.	Seconds of Tabular R.A.	Error of Tables.	N.P.D. of Center from Observation.	Seconds of Tabular N.P.D.	Error of Tables.
d. h. m. s.	h. m. s.	s.	s.	° ' "	"	"
Oct. 15. 9. 23. 31,1	22. 58. 47,39	52,36	+ 4,97	97. 23. 77,55	58,19	- 19,36
16. 9. 19. 28,8	22. 58. 40,98	46,07	+ 5,09			
19. 9. 7. 23,2	22. 58. 23,02	28,01	+ 4,99	97. 26. 39,67	21,49	- 18,18
28. 8. 31. 13,5	22. 57. 36,44	41,55	+ 5,11			
Nov. 12. 7. 31. 27,3	22. 56. 48,69	53,50	+ 4,81	97. 35. 31,46	10,90	- 20,56
16. 7. 15. 37,6	22. 56. 42,66	47,47	+ 4,81	97. 35. 56,25	37,90	- 18,35
20. 6. 59. 50,8	22. 56. 39,44	44,42	+ 4,98			
22. 6. 51. 58,8	22. 56. 39,26	44,03	+ 4,77	97. 35. 62,76	43,50	- 19,26
23. 6. 48. 2,8	22. 56. 39,20	44,13	+ 4,93	97. 35. 59,24	40,30	- 18,94
26. 6. 36. 16,5	22. 56. 40,71	45,53	+ 4,82	97. 35. 42,50	23,90	- 18,60
Dec. 7. 5. 53. 21,2	22. 57. 0,49	5,32	+ 4,83	97. 32. 71,04	52,71	- 18,33
12. 5. 33. 58,3	22. 57. 17,21	21,95	+ 4,74			
17. 5. 14. 40,0	22. 57. 38,43	43,13	+ 4,70	97. 28. 53,62	33,71	- 19,91
20. 5. 3. 6,8	22. 57. 53,03	58,04	+ 5,01			
24. 4. 47. 45,5	22. 58. 15,47	20,36	+ 4,89			

## DETERMINATION OF THE POSITION OF THE ECLIPTIC AND OF THE MEAN ERROR OF THE ASSUMED RIGHT ASCENSIONS OF THE FUNDAMENTAL STARS, FROM THE CIRCLE OBSERVATIONS OF THE SUN IN THE YEAR 1839.

The Observations (exclusive of those of single limbs) have been divided into groups, containing very nearly the same number of Observations; and the Table below exhibits the means of the days of Observation, and the mean values ( $\alpha$ ) of the Tabular Errors in North Polar Distance, of the several groups, derived from the columns in pages 200—202, together with the Sun's Longitude ( $\lambda$ ) and North Polar Distance ( $\Delta$ ) at the mean noons of the respective days.

Limiting Days of Observation of each group.	Mean Day.	Mean of the Tabular Errors in N.P.D.	Number of Observa- tions.	Sun's Longitude at mean noon.	Sun's N.P.D. at mean noon.
Jan. 8.....Jan. 29	Jan. 16	+ 1,24	11	295. 44. 53	111. 0. 56
Jan. 30.....Feb. 28	Feb. 13	+ 1,75	11	324. 9. 24	103. 28. 57
Mar. 4.....Apr. 16	Mar. 23	+ 1,46	12	2. 11. 19	89. 7. 43
Apr. 17.....May 3	Apr. 25	+ 1,08	11	34. 34. 26	76. 56. 31
May 4.....May 28	May 15	+ 0,18	11	53. 55. 42	71. 13. 37
May 29.....June 18	June 8	+ 0,49	11	76. 56. 56	67. 10. 41
June 20.....July 15	July 2	+ 0,11	11	99. 50. 56	66. 54. 12
July 16.....Aug. 21	July 31	+ 0,20	11	127. 31. 45	71. 35. 37
Aug. 22.....Sept. 14	Sept. 2	- 0,24	12	159. 17. 22	81. 54. 19
Sept. 18.....Oct. 7	Sept. 26	- 0,28	11	182. 41. 51	91. 4. 25
Oct. 9.....Nov. 9	Oct. 20	+ 0,19	11	206. 25. 33	100. 12. 22
Nov. 11.....Dec. 24	Dec. 4	+ 0,62	11	251. 42. 46	112. 12. 45

*Formulae of calculation.*

$$\alpha + m \cos \lambda \operatorname{cosec} \Delta + n \sin \lambda \operatorname{cosec} \Delta + p = 0 \dots (1)$$

And  $I$  being the obliquity of the Ecliptic,

$$\delta \lambda = m \times \operatorname{cosec} I \dots (2). \quad \delta I = n \times \sec I \dots (3). \quad \delta \Delta = \alpha + p \dots (4).$$



The following equations were deduced from the formula (1) by means of the Table above, and each equation is multiplied by the respective number of observations.

$$\begin{array}{lcl}
 \text{First Quarter} & \left\{ \begin{array}{l} \text{Jan. 16.....} + 13,64 + 5,1191 m - 10,6138 n + 11 p = 0. \\ \text{Feb. 13.....} + 18,25 + 9,1695 m - 6,6238 n + 11 p = 0. \\ \text{Mar. 23.....} + 17,52 + 11,9926 m + 0,4583 n + 12 p = 0. \end{array} \right. \\
 \\ 
 \text{Second Quarter} & \left\{ \begin{array}{l} \text{Apr. 25.....} + 11,88 + 9,2978 m + 6,4079 n + 11 p = 0. \\ \text{May 15.....} + 1,98 + 6,8407 m + 9,3907 n + 11 p = 0. \\ \text{June 8.....} + 5,39 + 2,6950 m + 11,6260 n + 11 p = 0. \end{array} \right. \\
 \\ 
 \text{Third Quarter} & \left\{ \begin{array}{l} \text{July 2.....} + 1,21 - 2,0455 m + 11,7823 n + 11 p = 0. \\ \text{July 31.....} + 2,20 - 7,0621 m + 9,1938 n + 11 p = 0. \\ \text{Sept. 2.....} - 2,88 - 11,3375 m + 4,2865 n + 12 p = 0. \end{array} \right. \\
 \\ 
 \text{Fourth Quarter} & \left\{ \begin{array}{l} \text{Sept. 26.....} - 3,08 - 10,9897 m - 3,5178 n + 11 p = 0. \\ \text{Oct. 20.....} + 2,09 - 10,0090 m - 4,9741 n + 11 p = 0. \\ \text{Dec. 4.....} + 6,82 - 3,7283 m - 11,2817 n + 11 p = 0. \end{array} \right.
 \end{array}$$

From the above, new equations are formed by adding and subtracting as indicated below

$$\begin{array}{l}
 \text{First Quarter} + \text{Second} + \text{Third} + \text{Fourth} \\
 + 76'',02 - 0,0574 m + 19,1343 n + 134 p = 0.
 \end{array}$$

$$\begin{array}{l}
 \text{First Quarter} + \text{Second} - \text{Third} - \text{Fourth} \\
 + 63'',30 + 90,2868 m + 2,1563 n = 0.
 \end{array}$$

$$\begin{array}{l}
 \text{First Quarter} - \text{Second} - \text{Third} + \text{Fourth} \\
 + 36'',46 + 3,1658 m - 86,2401 n = 0.
 \end{array}$$

The solution of these equations gives,

$$m = - 0'',711; \quad n = + 0'',397; \quad p = - 0'',624.$$

Hence by equation (2),  $\delta\lambda = - 0'',711 \times \text{cosec } 23^\circ.28' = - 1'',785$ . Consequently the Sun's longitude as calculated in the Nautical Almanac for 1839, is *less* than the longitude determined by observation, by the mean quantity  $1'',785$ . The mean error of R.A. for the year will be found by calculation to be  $1'',783$ .

Hence the mean Error of the Tabular Right Ascension (in time) =  $- 0^s,119$ .

By equation (3),  $\delta I = + 0'',397 \times \sec 23^\circ.28' = + 0'',433$ . Hence the obliquity assumed in the Nautical Almanac is *greater* than that by observation by  $0'',433$ .

The value of  $p$  shews that within the Tropics the North Polar Distances, determined by the Circle observations and calculations contained in this Volume, should be *increased* by the mean quantity  $0'',624$ .

The mean Error of the Solar Tables in Right Ascension for the year, as derived from 120 Tabular errors in pages 200—202, (observations of single limbs, and that of Oct. 16 being excluded) will be found to be  $- 0^s,086$ .

Hence the assumed R.A. of the fundamental stars are too great by  $- 0^s,119 + 0^s,086$  that is, *too small* by  $0^s,033$ .

COMPARISONS OF CLOCKS

AND

CHRONOMETERS.

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1839.



\* \* THE letter *H* is an abbreviation for Hardy, the Transit Clock: *G* for Graham, the Clock in the Dome, commonly used with the Five-feet Equatoreal. *U* and *X* are Sidereal Chronometers, and *W* is a Solar Chronometer, each beating half-seconds.

Day of Comparison.	Clock.	Clock Time.	Chron.	Chronometer Time.	Day of Comparison.	Clock.	Clock Time.	Chron.	Chronometer Time.
		<i>h.</i> <i>m.</i> <i>s.</i>		<i>h.</i> <i>m.</i> <i>s.</i>			<i>h.</i> <i>m.</i> <i>s.</i>		<i>h.</i> <i>m.</i> <i>s.</i>
Feb. 23	H.	9.18.43	W.	11. 7.50,0	Mar. 27	H.	12.37. 9	U.	12.36.36,0
	H.	9.19.28	W.	11. 8.35,0		H.	14.13.22	W.	13.53.46,5
	G.	10.23.16	U.	10.23.29,3		H.	14.14.41	W.	13.55. 5,5
	G.	10.24. 0	U.	10.24.13,3	Apr. 1	H.	13.24. 3	W.	12.44.10,0
	H.	10.25.30	U.	10.25.49,2		H.	13.24.44	W.	12.44.51,0
	H.	10.25.59	U.	10.26.18,2	Apr. 6	H.	12.21.35	W.	11.21.30,5
Feb. 25	G.	11.22. 8	U.	11.22. 0,5		H.	12.22.20	W.	11.22.15,5
	G.	11.22.29	U.	11.22.21,5		*G.	13. 3.16	U.	13. 1.25,0
	H.	11.23.44	U.	11.23.55,4		G.	13. 3.36	U.	13. 1.45,0
	H.	11.24.16	U.	11.24.27,4		H.	13.13.38	U.	13.13.40,7
	H.	12.54.36	W.	14.35.19,5		H.	13.13.56	U.	13.12.58,6†
	H.	12.55.17	W.	14.36. 0,5	Aug. 25	H.	19.46.24	X.	19.48.15,0
Feb. 27	H.	9.45.43	W.	11.19. 5,0		H.	19.47.14	X.	19.49. 5,0
	H.	9.47.23	W.	11.20.44,5		G.	19.45.47	U.	19.43.25,0
	H.	11.10.47	W.	12.43.55,0		G.	19.46. 4	U.	19.43.42,0
	H.	11.12.13	W.	12.45.20,5		H.	19.49.44	U.	19.50. 6,8
	G.	11.52.28	U.	11.52. 2,0		H.	19.50. 2	U.	19.50.24,9
	G.	11.52.51	U.	11.52.25,0		G.	21.49.11	U.	21.46.49,9
	H.	11.55.57	U.	11.56. 4,0		G.	21.49.56	U.	21.47.34,9
	H.	11.56.23	U.	11.56.30,0		H.	21.49.34	U.	21.49.58,4
Mar. 9	G.	11.23.21	U.	11.21.43,5		H.	21.50. 3	U.	21.50.27,3
	G.	11.23.45	U.	11.22. 7,5	Aug. 30	H.	20.14.53	U.	20.15.46,0
	H.	11.27.14	U.	11.27. 9,4		H.	20.15.22	U.	20.16.15,0
	H.	11.27.41	U.	11.27.36,4		G.	20.20.35	W.	9.42.45,0
Mar. 11	G.	12.35.14	U.	12.33.41,6		G.	20.21.10	W.	9.43.20,0
	G.	12.35.37	U.	12.34. 4,6		H.	20.20.24	W.	9.45.55,5
	H.	12.37.36	U.	12.37.47,0		H.	20.20.59	W.	9.46.30,5
	H.	12.37.53	U.	12.38. 4,0	Sept. 19	H.	22.19.30	X.	22.23. 0,7
Mar. 13	G.	10.52. 6	U.	10.50.34,5		H.	22.20.40	X.	22.24.10,8
	G.	10.52.23	U.	10.50.51,5	Sept. 26	G.	4.45.25	X.	4.42.55,0
	H.	11. 0.14	U.	11. 0.36,0		G.	4.46.27	X.	4.43.57,0
	H.	11. 0.35	U.	11. 0.57,0		G.	5.35.20	X.	5.32.50,0
Mar. 15	G.	9.52.57	U.	9.51.24,0		H.	5.31.28	X.	5.35.25,1
	G.	9.53.16	U.	9.51.43,0		H.	5.33.18	X.	5.37.15,0
	H.	9.53.40	U.	9.54.13,0	Oct. 19	G.	20.13.30	X.	20. 4.45,5
	H.	9.54. 0	U.	9.54.33,0		‡G.	20.14.20	X.	20. 5.35,5
Mar. 19	H.	7.15.40	W.	7.29.55,5		H.	20.13.24,3	X.	20.13.40,5
	H.	7.17.20	W.	7.31.35,0		H.	20.14.29,3	X.	20.14.45,5
	G.	8. 2.24	U.	8. 0.21,7		G.	22. 7. 5	X.	22. 8.20,5
	G.	8. 2.58	U.	8. 0.55,7		G.	22. 8. 6	X.	22. 9.21,5
	H.	8. 2.43	U.	8. 3.13,0		H.	22.15.14	X.	22.15.30,5
	H.	8. 3. 6	U.	8. 3.36,0		H.	22.16. 4	X.	22.16.20,5
	H.	10.12. 7	U.	10.12.37,0	Nov. 19	G.	5.44.56	U.	5.44.22,8
	H.	10.12.29	U.	10.12.59,0		G.	5.45.21	U.	5.44.47,8
	G.	10.16. 2	U.	10.13.59,0		H.	5.44.48	U.	5.46.59,0
	G.	10.16.27	U.	10.14.24,0		H.	5.45.19	U.	5.47.30,0
	H.	10.38. 9	W.	10.51.50,0	Nov. 20	G.	5.22.22	U.	5.21.51,4
	H.	10.38.49	W.	10.52.30,0		G.	5.22.49	U.	5.22.18,4
Mar. 27	G.	12.19.40	U.	12.16.40,0		H.	5.21.30	U.	5.23.49,9
	G.	12.20.15	U.	12.17.15,0		H.	5.21.55	U.	5.24.15,0
	H.	12.36.49	U.	12.36.16,0					

\* Before this comparison, *G* appears to have been put backward 2<sup>m</sup>: no memorandum was made.

† The minutes should probably be 13.

‡ After this comparison, *G* was put backward 10 minutes.

Day of Comparison.	Clock.	Clock Time.	Chron.	Chronometer Time.	Day of Comparison.	Clock.	Clock Time.	Chron.	Chronometer Time.
		<i>h. m. s.</i>		<i>h. m. s.</i>			<i>h. m. s.</i>		<i>h. m. s.</i>
Dec. 24	G.	8.44.21	W.	14.24.50,5	Jan. 10	H.	14.28.28	W.	19.10.26,4
	G.	8.45.11	W.	14.25.40,5		H.	14.28.52	W.	19.10.50,4
	H.	8.48.10	W.	14.33.50,5		G.	14.36.13	W.	19.11.41,0
	H.	8.48.55	W.	14.34.35,5		G.	14.36.38	W.	19.12.6,0
	H.	13.28.37	W.	19.13.30,0		H.	14.56.54,2	X.	14.59.0,5
	H.	13.29.42	W.	19.14.35,0		H.	14.57.59,2	X.	15.0.5,5
Dec. 27	G.	14.12.52	W.	19.40.6,5	Jan. 15	H.	14.44.21	W.	19.5.5,0
	G.	14.14.56	W.	19.42.10,0		H.	14.44.47	W.	19.5.31,0
	H.	14.12.28	W.	19.45.10,0		G.	14.51.41	W.	19.6.41,5
	H.	14.13.40	W.	19.46.21,5		G.	14.52.7	W.	19.7.7,5
Dec. 28	G.	13.3.44	X.	12.59.25,5	Jan. 17	G.	15.26.26	W.	19.33.3,5
	G.	13.4.38	X.	13.0.19,5		G.	15.26.49	W.	19.33.26,5
	H.	13.18.52	X.	13.20.5,5		H.	15.22.46	W.	19.35.19,0
	H.	13.19.38	X.	13.20.51,5		H.	15.23.12	W.	19.35.45,0
Dec. 29	G.	13.2.59	X.	12.58.40,5		H.	16.10.6	X.	16.11.40,5
	G.	13.3.44	X.	12.59.25,5	Jan. 20	H.	16.10.46	X.	16.12.20,5
	H.	13.3.13	X.	13.4.30,5		G.	15.2.3	W.	18.52.4,5
	H.	13.5.8	X.	13.6.25,5		G.	15.2.30	W.	18.52.31,5
1840.						H.	15.1.6	W.	18.57.33,0
Jan. 1	G.	14.37.34	W.	19.44.1,0		H.	15.1.53	W.	18.58.20,0
	G.	14.39.9	W.	19.45.35,5	Jan. 26	G.	15.11.37	W.	18.40.49,5
	H.	14.35.41	W.	19.48.1,5		G.	15.12.1	W.	18.41.13,5
	H.	14.36.25	W.	19.48.45,5		H.	15.9.6	W.	18.45.16,5
Jan. 2	G.	12.56.37	X.	12.52.11,0		H.	15.9.30	W.	18.45.40,5
	G.	12.57.31	X.	12.53.5,0		H.	17.28.30	X.	17.30.45,5
	H.	12.56.45	X.	12.58.20,0		H.	17.29.5	X.	17.31.20,5
	H.	12.58.45,3	X.	13.0.20,0					
Jan. 6	G.	13.38.5	X.	13.33.35,5	Jan. 29	H.	15.18.5	W.	18.42.5,0
	G.	13.38.55	X.	13.34.25,5		H.	15.18.39	W.	18.42.39,0
	H.	13.35.34	X.	13.37.25,5		G.	15.26.54	W.	18.43.42,5
	H.	13.36.39	X.	13.38.30,5		G.	15.27.16	W.	18.44.4,5





DIFFERENCES  
OF  
NORTH POLAR DISTANCE OF MARS  
AND STARS ADJACENT,  
OBSERVED WITH THE NORTHUMBERLAND EQUATOREAL,  
AND THE FIVE-FEET EQUATOREAL;  
AND  
CONCLUDED NORTH POLAR DISTANCES OF MARS,  
COMPARED WITH THE NORTH POLAR DISTANCES INTERPOLATED  
FROM THE NAUTICAL ALMANAC.  

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1839.



Day 1839.	Number of Series.	Object.	Micrometer.	Micrometer Reading.	Time by Chronometer W.	Sidereal Time.	Apparent Excess of N.P.D. of Limb of Mars above N.P.D. of *.	Diameter of Mars by observation.	Observer.
				d. r.	h. m. s.	h. m. s.	" "	"	
Feb. 23	1	Mars S.L. ... N.L. * (c)	A. B. B.	17,127 3,972 15,335	13.19.28,0 13.28.23,0	11.31.16,1 11.40.12,6	+3.31,34 +3.12,95	18,39	C.
	2	Mars S.L. ... N.L. * (c)	A. B. B.	17,116 3,932 14,927	13.39.49,0 13.48.45,0	11.51.40,5 12.0.37,9	+3.24,23 +3.6,70	17,53	C.
	3	Mars S.L. ... N.L. * (c)	A. B. B.	16,742 4,323 15,017	13.56.23,0 14.5.19,0	12.8.17,2 12.17.14,7	+3.19,40 +3.1,59	17,81	C.
Feb. 25	4	Mars N.L. ... S.L. * (d)	B. A. A.	12,051 8,940 14,003	12.19.59,0 12.21.57,0	10.39.29,0 10.41.27,3	-1.42,53 -1.25,98	16,55	C.
	5	Mars N.L. ... S.L. * (d)	B. A. A.	12,181 8,773 13,950	12.30.21,0 12.32.10,0	10.49.52,7 10.51.42,0	-1.43,84 -1.27,91	15,93	C.
Feb. 27	6	Mars S.L. ... N.L. * (f)	A. B. B.	10,687 10,257 11,408	11.45.22,5 11.54.36,5	10.12.42,8 10.21.58,3	+0.35,30 +0.19,54	15,76	C.
	7	Mars S.L. ... N.L. * (f)	A. B. B.	10,323 10,571 11,433	11.59.5,0 12.8.20,0	10.26.27,6 10.35.44,1	+0.29,55 +0.14,64	14,91	C.
	8	Mars S.L. ... N.L. * (f)	A. B. B.	10,065 10,846 11,454	12.10.52,0 12.20.7,0	10.38.16,6 10.47.33,2	+0.25,53 +0.10,33	15,20	C.
	9	Mars S.L. ... N.L. * (f)	A. B. B.	9,755 11,180 11,506	12.24.0,5 12.33.16,0	10.51.27,3 11.0.44,3	+0.21,14 +0.5,53	15,61	C.
Mar. 27	10	* Leonis. Mars S.L. ... N.L.	A. A. B.	17,500 1,862 19,063	12.18.43,0 12.24.0,0	12.38.10,6 12.43.28,5	-4.25,53 -4.40,96	15,43	C.
	11	* Leonis. Mars S.L. ... N.L.	A. A. B.	19,067 3,281 17,646	12.38.18,0 12.43.33,5	12.57.48,9 13.3.5,2	-4.28,05 -4.43,52	15,47	C.
	12	* Leonis. Mars S.L. ... N.L.	A. A. B.	19,049 2,929 17,940	12.52.8,0 12.57.22,0	13.11.41,1 13.16.56,0	-4.33,73 -4.48,21	14,48	C.
	13	* Leonis. Mars S.L. ... N.L.	A. A. B.	18,994 2,822 18,092	13.8.25,0 13.13.37,0	13.28.0,8 13.33.13,7	-4.34,62 -4.49,87	15,25	C.
April 1	14	* Leonis. Mars S.L.	C. C.	23.1,848 2.2,470	11.20.16,5 11.28.48,0	12.0.9,0 12.8.41,9	-71.25,50		C.

The illuminated side of the Telescope was West. The micrometer head, which is marked by the letter A, was uppermost when the telescope looked southward, the position circle having been previously adjusted to make an equatoreal star move along the wire A. One micrometer revolution of each micrometer = 16",970. When the two wires are coincident, the reading of B is 10',016 when the reading of A is 10',000.

Nº. 1. In the observation of Mars, the eye-piece was not in good focus.

Nº. 4. In this instance the star was bisected 9" after passing the fixed vertical wire which marks the middle of the field. In every other instance both the planet and the star were observed at the fixed wire.

Greenwich Mean Solar Time of Observation of Mars.	Hour angle from Meridian.	Correction for Parallax.	Correction for Semi- diameter.	Excess of N.P.D. of Mars' center above N.P.D. of $\star$ .	Assumed N.P.D. of $\star$ .	Concluded N.P.D. of Mars.	Seconds of Tabular N.P.D.	Error of Tabular N.P.D.
<i>h. m. s.</i>	<i>h. m.</i>	<i>"</i>	<i>"</i>	<i>" "</i>	<i>0 " "</i>	<i>0 " "</i>	<i>"</i>	<i>"</i>
13.17.55,4	0.23	-8,93		+3.13,22	85.3.5,4	85.6.18,62	16,30	-2,32
13.38.16,4	0.3	-8,92		+3.6,55	.....	85.6.11,95	10,02	-1,93
13.54.50,4	0.14	-8,92		+3.1,58	.....	85.6.6,98	4,92	-2,06
12.18.24,9	1.13	-8,99		-1.43,25	84.53.13,0	84.51.29,75	26,47	-3,28
12.28.46,9	1.2	-8,98		-1.44,86	.....	84.51.28,14	23,13	-5,01
11.43.51,3	1.37	-9,13		+0.18,29	84.35.28,3	84.35.46,59	51,79	+5,20
11.57.33,8	1.24	-9,12		+0.12,98	.....	84.35.41,28	47,21	+5,93
12.9.20,9	1.12	-9,10		+0.8,83	.....	84.35.37,13	43,26	+6,13
12.22.29,4	0.59	-9,09		+0.4,25	.....	84.35.32,55	38,87	+6,32
12.24.6,9	1.33	-8,68		-4.41,93	81.3.38,8	80.58.56,87	63,27	+6,40
12.43.40,4	1.52	-8,72		-4.44,50	.....	80.58.54,30	58,91	+4,61
12.57.28,9	2.6	-8,76		-4.49,73	.....	80.58.49,07	55,83	+6,76
13.13.43,9	2.22	-8,80		-4.51,05	.....	80.58.47,75	52,20	+4,45
11.29.46,5	1.3	-8,43	-7,57	-71.41,50	81.47.49,8	80.36.8,30	4,84	-3,46

Nº. 10. The times by W are perhaps not correct to a second. In this set the Hour Circle was not clamped: but I have no reason to suspect any motion about the polar axis.

Nº. 13. The time by W for the observation of Mars is doubtful.

Nº. 14 and 15. These observations were made with the sector. The letter C designates the sector microscope-micrometer. One micrometer revolution =  $10''$ ,178. One sector division ( $d$ ) =  $204''$ ,258. The star and S.L. of Mars were bisected by the wire A, its reading being  $10'$ ,000; and N.L. was bisected by the wire B, the reading in the first set being  $10'$ ,908, and in the other  $10'$ ,878; whence the corrections for semi-diameters are calculated. The observations were very doubtful, it being extremely cloudy. Perhaps also the arcs are too great for the sector to measure with certainty.



## 220 OBSERVATIONS OF MARS AND ADJACENT STARS WITH NORTHUMBERLAND EQUATOREAL.

Day 1839.	Number of Series.	Object.	Micrometer.	Micrometer Reading.	Time by Chronometer W.	Sidereal Time.	Apparent Excess of N.P.D. of Limb of Mars above N.P.D. of $\star$ .	Diameter of Mars by observation.	Observer.		
				d. r.	h. m. s.	h. m. s.	" "	"			
April 1	15	$\chi$ Leonis. Mars S.L.	C. C.	23.2,430 2.0,914	12. 5. 59,0 12.14:28,0	12.45.59,1 12.54.29,5	-71.47,47		C.		
April 6	16	* (E) Mars S.L. ... N.L.	B.	17,923	10.31.36,0	11.31.51,7	+4.45,94 +4.29,97	15,97	C.		
			A.	18,933	10.38.17,0	11.38.33,8					
			B.	2,023							
	17	* (E) Mars S.L. ... N.L.	B.	17,956	10.44.47,0	11.45. 4,9	+4.43,14 +4.28,28	14,86	C.		
			A.	18,735	10.51.28,0	11.51.47,0					
	B.	2,156									
18	* (E) Mars S.L. ... N.L.	B.	17,967	10.56.23,0	11.56.42,8	+4.41,51 +4.26,70	14,81	C.			
		A.	18,628	11. 3. 4,0	12. 3.24,9						
		B.	2,260								

Illuminated side of telescope West. One micrometer revolution of A or B =  $16''$ ,970. One micrometer revolution of C =  $10''$ ,178. One sector division =  $204''$ ,258. Coincidence reading of B =  $10'$ ,016, when A reads  $10'$ ,000.

Nº. 16. The star very faint and bisection doubtful.

Greenwich Mean Solar Time of Observation of Mars.	Hour angle from Meridian.	Correction for Parallax.	Correction for Semi- diameter.	Excess of N.P.D. of Mars' center above N.P.D. of $\times$ .	Assumed N.P.D. of $\times$ .	Concluded N.P.D. of Mars.	Seconds of Tabular N.P.D.	Error of Tabular N.P.D.
<i>h. m. s.</i>	<i>h. m.</i>	<i>"</i>	<i>"</i>	<i>' "</i>	<i>0 ' "</i>	<i>0 ' "</i>	<i>"</i>	<i>"</i>
12 . 15 . 26,5	1 . 49	- 8,52	- 7,31	- 72 . 3,30	81 . 47 . 49,8	80 . 35 . 46,50	57,46	+ 10,96
10 . 40 . 3,7	0 . 38	- 8,09		+ 4 . 29,87	80 . 16 . 0,4	80 . 20 . 30,27	35,37	+ 5,10
10 . 53 . 14,8	0 . 52	- 8,10		+ 4 . 27,61	.....	80 . 20 . 28,01	34,09	+ 6,08
11 . 4 . 50,8	1 . 3	- 8,12		+ 4 . 25,99	.....	80 . 20 . 26,39	32,95	+ 6,56



Day 1839.	Number of Series.	Object.	Micrometer.	Micrometer Reading.	Time by Graham.	Sidereal Time.	Apparent Excess of N.P.D. of Limb of Mars above N.P.D. of $\star$ .	Diameter of Mars by observation.	Observer.
				<i>r.</i>	<i>h. m. s.</i>	<i>h. m. s.</i>	<i>" "</i>	<i>" "</i>	<i>i</i>
Feb. 25	1	Mars N.L.	L.	10,426	10.58.32	10.58.48,9	-1.53,83	17,01	G.
		... S.L. * (d)	U.	12,938	11.0.21	11.0.37,9	-1.36,82		
	2	Mars N.L.	L.	10,410	11.2.54	11.3.10,9	-1.50,69	16,47	G.
		... S.L. * (d)	U.	12,860	11.4.43	11.4.59,9	-1.34,22		
	3	Mars N.L.	L.	10,420	11.6.28	11.6.44,9	-1.51,76	16,81	G.
		... S.L. * (d)	U.	12,882	11.8.18	11.8.34,9	-1.34,95		
Feb. 27	4	Mars N.L.	L.	10,392	11.9.16	11.9.32,9	-1.54,17	15,88	G.
		... S.L. * (d)	U.	12,982	11.11.6	11.11.22,8	-1.38,29		
	5	Mars N.L.	L.	10,445	11.12.14	11.12.30,8	-1.55,94	17,65	G.
		... S.L. * (d)	U.	12,982	11.14.4	11.14.20,8	-1.38,29		
	6	Mars N.L.	L.	10,454	11.14.54	11.15.10,8	-1.55,60	17,94	G.
		... S.L. * (d)	U.	12,963	11.16.44	11.17.0,8	-1.37,66		
Feb. 27	7	Mars N.L.	L.	10,410	11.0.59	11.1.3,8	+0.3,31	16,48	G.
		... S.L. * (f)	L.	10,509	11.10.18	11.10.22,8	+0.19,79		
	8	Mars N.L.	L.	10,412	11.11.17	11.11.21,8	-0.0,57	16,55	G.
		... S.L. * (f)	L.	10,395	11.20.36	11.20.40,7	+0.15,98		
	9	Mars N.L.	L.	10,439	11.21.50	11.21.54,7	-0.1,30	17,45	G.
		... S.L. * (f)	L.	10,400	11.31.9	11.31.13,7	+0.16,15		
Mar. 9	10	Mars N.L.	L.	10,429	11.32.12	11.32.16,7	-0.6,65	17,11	G.
		... S.L. * (f)	L.	10,230	11.41.33	11.41.37,7	+0.10,46		
	11	Mars N.L.	L.	10,458	11.44.20	11.44.24,6	-0.12,03	18,08	G.
		... S.L. * (f)	L.	10,098	11.53.41	11.53.45,6	+0.6,05		
	12	Mars S.L.	U.	10,505	11.3.28	11.2.43,9	-1.20,05	15,50	G.
		... N.L. * (p)	U.	12,900	11.6.19	11.5.34,9	-1.35,55		
Mar. 9	13	Mars S.L.	U.	10,510	11.7.31	11.6.46,9	-1.24,22	15,68	G.
		... N.L. * (p)	U.	13,030	11.10.19	11.9.34,9	-1.39,90		
	14	Mars S.L.	U.	10,499	11.11.21	11.10.36,9	-1.28,53	15,30	G.
		... N.L. * (p)	U.	13,148	11.14.10	11.13.25,9	-1.43,83		
Mar. 9	15	Mars S.L.	U.	10,490	11.15.13	11.14.28,9	-1.27,56	15,01	G.
		... N.L. * (p)	U.	13,110	11.18.5	11.17.20,9	-1.42,57		

The graduated face of the declination circle was West. The micrometer L is that which is below when in this position of the circle the telescope looks southward. One micrometer revolution =  $33''.400$ . The coincidence reading of L with the fixed wire at the middle vertical wire =  $9^{\circ}.917$ , that of U =  $10^{\circ}.041$ . When no micrometer wire is mentioned, it is to be understood that the object was observed on the fixed wire.

Nº. 1. The lamp light was bad in this set, but improved in the next. Throughout the night's observations the star was too faint to allow of good illumination of the wires.

Greenwich Mean Solar Time of Observation of Mars.	Hour angle from Meridian.	Correction for Parallax.	Correction for Semi- diameter.	Excess of N.P.D. of Mars' center above N.P.D. of $\star$ .	Assumed N.P.D. of $\star$ .	Concluded N.P.D. of Mars.	Seconds of Tabular N.P.D.	Error of Tabular N.P.D.
<i>h. m. s.</i>	<i>h. m.</i>	<i>"</i>	<i>"</i>	<i>' "</i>	<i>0 ' "</i>	<i>0 ' "</i>	<i>"</i>	<i>"</i>
12.37.41,7	0.54	-8,98		-1.54,31	84.53.13,0	84.51.18,69	20,26	+1,57
12.42.2,9	0.49	-8,97		-1.51,42	.....	84.51.21,58	18,85	-2,73
12.45.36,4	0.46	-8,97		-1.52,33	.....	84.51.20,67	17,70	-2,97
12.48.23,9	0.43	-8,97		-1.55,20	.....	84.51.17,80	16,80	-1,00
12.51.21,3	0.40	-8,97		-1.56,09	.....	84.51.16,91	15,85	-1,06
12.54.0,9	0.37	-8,97		-1.55,60	.....	84.51.17,40	15,00	-2,40
12.32.4,4	0.49	-9,08		+0.2,47	84.35.28,3	84.35.30,77	35,66	+4,89
12.42.20,7	0.39	-9,08		-0.1,37	.....	84.35.26,93	32,23	+5,30
12.52.51,8	0.28	-9,07		-0.1,64	.....	84.35.26,66	28,71	+2,05
13.3.12,2	0.18	-9,07		-0.7,16	.....	84.35.21,14	25,25	+4,11
13.15.18,1	0.6	-9,07		-0.12,06	.....	84.35.16,24	21,20	+4,96
11.54.25,1	0.34	-9,08		-1.36,88	83.13.8,7	83.11.31,82	28,78	-3,04
11.58.27,5	0.30	-9,07		-1.41,13	.....	83.11.27,57	27,33	-0,24
12.2.16,8	0.26	-9,07		-1.45,25	.....	83.11.23,45	25,97	+2,52
12.6.8,2	0.22	-9,07		-1.44,14	.....	83.11.24,56	24,60	+0,04

Nº. 7. Before the observation of the star, the eye-end of the telescope was slightly struck. This night's observations were considered pretty good.

Nº. 12—17. These observations were all unsatisfactory on account of the extreme faintness of the star.



Day 1839.	Number of Series.	Object.	Micrometer.	Micrometer Reading.	Time by Graham.	Sidereal Time.	Apparent Excess of N.P.D. of Limb of Mars above N.P.D. of $\star$ .	Diameter of Mars by observation.	Observer.
				r.	h. m. s.	h. m. s.	" "	"	
Mar. 9	16	Mars S.L.	U.	10,514	11.18.58	11.18.13,9	-1.28,59	15,81	G.
		... N.L. * (p)	U.	13,165	11.21.48	11.21.3,9	-1.44,40		
	17	Mars S.L.	U.	10,515	11.22.44	11.21.59,9	-1.32,31	15,84	G.
		... N.L. * (p)	U.	13,277	11.25.34	11.24.49,9	-1.48,15		
Mar. 11	18	* (r)	L.	17,605	12.15.26	12.14.34,1		18,25	G.
		Mars S.L.	U.	9,222	12.19.56	12.19.4,1	+3.49,57		
		... N.L.	L.	11,282			+3.31,32		
	19	* (r)	L.	17,550	12.21.27	12.20.35,1		16,88	G.
		Mars S.L.	U.	9,143	12.25.58	12.25.6,1	+3.45,19		
		... N.L.	L.	11,320			+3.28,31		
	20	* (r)	L.	17,548	12.27.9	12.26.17,1		17,31	G.
		Mars S.L.	U.	9,100	12.31.39	12.30.47,1	+3.43,58		
		... N.L.	L.	11,376			+3.26,27		
	21	* (r)	L.	17,505	12.32.35	12.31.43,1		17,38	G.
		Mars S.L.	U.	9,080	12.37.7	12.36.15,0	+3.41,47		
		... N.L.	L.	11,398			+3.24,09		
	22	* (r)	L.	17,607	12.38.14	12.37.22,0		17,28	G.
		Mars S.L.	U.	8,955	12.42.44	12.41.52,0	+3.40,70		
		... N.L.	L.	11,520			+3.23,42		
	23	* (r)	L.	17,514	12.44.12	12.43.20,6		17,78	G.
		Mars S.L.	U.	8,890	12.48.41	12.47.49,6	+3.35,42		
		... N.L.	L.	11,600			+3.17,64		
Mar. 13	24	Mars S.L. v Virginis.	L.	17,190	10.11.3 10.17.56	10.10.2,8 10.16.55,8	+4.3,07		G.
	25	Mars N.L.	L.	10,456	10.19.25	10.18.24,8	+3.41,47	18,01	G.
		... S.L. v Virginis.	L.	17,083	10.26.18	10.25.17,8	+3.59,48		
	26	Mars N.L.	L.	10,378	10.27.33	10.26.32,8	+3.43,65	15,40	G.
		... S.L. v Virginis.	L.	17,070	10.34.27	10.33.26,8	+3.59,05		
	27	Mars N.L.	L.	10,460	10.35.32	10.34.31,7	+3.37,63	18,15	G.
		... S.L. v Virginis.	L.	16,972	10.42.25	10.41.24,7	+3.55,78		
Mar. 15	28	Mars N.L.	L.	10,400	10.43.27	10.42.26,7	+3.34,89	16,14	G.
		... S.L. v Virginis.	L.	16,830	10.50.22	10.49.21,7	+3.51,03		
	29	Mars N.L.	L.	10,379	10.51.28	10.50.27,7	+3.33,31	15,44	G.
		... S.L. v Virginis.	L.	16,762	10.58.24	10.57.23,7	+3.48,75		
	30	* (s)	L.	12,270	9.29.18	9.28.7,3		15,74	G.
		Mars N.L. ... S.L.	U.	10,512	9.29.26	9.28.15,3	+1.18,64 +1.34,38		

Graduated face of Declination Circle West. One micrometer revolution =  $33''$ ,400. Coincidence reading of L =  $9^{\circ}$ ,917: that of U =  $10^{\circ}$ ,041.

N<sup>os</sup>. 18—23. These observations were satisfactory.

Greenwich Mean Solar Time of Observation of Mars.	Hour angle from Meridian.	Correction for Parallax.	Correction for Semi- diameter.	Excess of N.P.P. of Mars' center above N.P.D. of $\star$ .	Assumed N.P.D. of $\star$ .	Concluded N.P.D. of Mars.	Seconds of Tabular N.P.D.	Error of Tabular N.P.D.
<i>h. m. s.</i>	<i>h. m.</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>0 . . "</i>	<i>0 . . "</i>	<i>"</i>	<i>"</i>
12 . 9 . 52,6	0 . 18	-9,07		-1.45,57	83.13. 8,7	83.11.23,13	23,26	+0,13
12.13.38,0	0.15	-9,07		-1.49,30	.....	83.11.19,40	21,92	+2,52
13. 2.41,0	0.46	-9,11		+3.31,34	82.50.34,5	82.54. 5,84	1,89	-3,95
13. 8.42,0	0.52	-9,12		+3.27,63	.....	82.53.62,13	59,77	-2,36
13.14.22,1	0.57	-9,12		+3.25,82	.....	82.53.60,32	57,77	-2,55
13.19.49,1	1. 3	-9,13		+3.23,65	.....	82.53.58,15	55,84	-2,31
13.25.25,2	1. 8	-9,13		+3.22,93	.....	82.53.57,43	53,88	-3,55
13.31.21,8	1.14	-9,14		+3.17,39	.....	82.53.51,89	51,78	-0,11
10.46. 9,0	1.21	-9,11	-7,90	+3.46,06	82.34.16,1	82.38. 2,16	3,49	+1,33
10.54.29,6	1.12	-9,10		+3.41,38	.....	82.37.57,48	60,61	+3,13
11. 2.36,3	1. 4	-9,09		+3.42,26	.....	82.37.58,36	57,80	-0,56
11.10.33,9	0.56	-9,08		+3.37,63	.....	82.37.53,73	55,06	+1,33
11.18.27,6	0.48	-9,07		+3.33,89	.....	82.37.49,99	52,32	+2,33
11.26.27,3	0.40	-9,06		+3.31,97	.....	82.37.48,07	49,56	+1,49
9.56.36,5	2. 0	-9,15		+1.17,36	82.20.38,2	82.21.55,56	58,60	+3,04

N<sup>os</sup>. 24—29. Sometimes cloudy, but the observations on the whole were good.

N<sup>os</sup>. 30—46. Satisfactory observations, though clouds came over now and then, and the wind was noisy.



Day 1839.	Number of Series.	Object.	Micrometer.	Micrometer Reading.	Time by Graham.	Sidereal Time.	Apparent Excess of N.P.D. of Limb of Mars above N.P.D. of $\times$ .	Diameter of Mars by observation.	Observer.
				r.	h. m. s.	h. m. s.	" "	"	
Mar. 15	31	* (s) Mars N.L. ... S.L.	L.	12,270	9.31.5	9.29.54,3	+1.18,64 +1.34,65	16,01	G.
			U.	10,520	9.31.14	9.30.5,3			
	32	* (s) Mars N.L. ... S.L.	L.	12,270	9.32.23	9.31.12,3	+1.18,64 +1.33,98	15,34	G.
			U.	10,500	9.32.30	9.31.19,3			
	33	* (s) Mars N.L. ... S.L.	L.	12,228	9.33.53	9.32.42,3	+1.17,23 +1.32,01	14,78	G.
			U.	10,483	9.34.0	9.32.49,3			
	34	* (s) Mars N.L. ... S.L.	L.	12,240	9.35.7	9.33.56,3	+1.17,64 +1.33,32	15,68	G.
			U.	10,510	9.35.15	9.34.4,3			
	35	* (s) Mars N.L. ... S.L.	L.	12,193	9.35.59	9.34.48,3	+1.16,07 +1.32,35	16,28	G.
			U.	10,528	9.36.7	9.34.56,3			
	36	* (s) Mars N.L. ... S.L.	L.	12,200	9.37.4	9.35.53,3	+1.16,30 +1.32,31	16,01	G.
			U.	10,520	9.37.12	9.36.1,3			
	37	* (s) Mars N.L. ... S.L.	L.	12,190	9.38.5	9.36.54,2	+1.15,97 +1.31,98	16,01	G.
			U.	10,520	9.38.13	9.37.2,2			
	38	* (s) Mars N.L. ... S.L.	L.	12,165	9.39.6	9.37.55,2	+1.15,13 +1.31,07	15,94	G.
			U.	10,518	9.39.14	9.38.3,2			
	39	* (s) Mars N.L. ... S.L.	L.	12,163	9.41.20	9.40.9,2	+1.15,07 +1.31,14	16,07	G.
			U.	10,522	9.41.28	9.40.17,2			
	40	* (s) Mars N.L. ... S.L.	L.	12,120	9.42.13	9.41.2,2	+1.13,63 +1.29,98	16,35	G.
			U.	10,530	9.42.21	9.41.10,2			
	41	* (s) Mars N.L. ... S.L.	L.	12,098	9.43.9	9.41.58,2	+1.12,88 +1.28,82	15,94	G.
			U.	10,518	9.43.17	9.42.6,2			
	42	* (s) Mars N.L. ... S.L.	L.	12,114	9.44.5	9.42.54,2	+1.13,42 +1.29,69	16,27	G.
			U.	10,528	9.44.13	9.43.2,2			
	43	* (s) Mars N.L. ... S.L.	L.	12,098	9.45.13	9.44.2,2	+1.12,88 +1.28,56	15,68	G.
			U.	10,510	9.45.21	9.44.10,2			
	44	* (s) Mars N.L. ... S.L.	L.	12,070	9.46.23	9.45.12,2	+1.11,95 +1.27,29	15,34	G.
			U.	10,500	9.46.31	9.45.20,2			
	45	* (s) Mars N.L. ... S.L.	L.	12,070	9.47.30	9.46.19,2	+1.11,95 +1.27,43	15,48	G.
			U.	10,504	9.47.37	9.46.26,2			

Graduated face of Declination Circle West. One micrometer revolution =  $33''$ ,400. Coincidence reading of L =  $9^{\circ}$ ,917: that of U =  $10^{\circ}$ ,041.

Greenwich Mean Solar Time of Observation of Mars.	Hour angle from Meridian.	Correction for Parallax.	Correction for Semi- diameter.	Excess of N.P.D. of Mars' center above N.P.D. of $\star$ .	Assumed N.P.D. of $\star$ .	Concluded N.P.D. of Mars.	Seconds of Tabular N.P.D.	Error of Tabular N.P.D.
<i>h. m. s.</i>	<i>h. m.</i>	<i>"</i>	<i>"</i>	<i>" "</i>	<i>0 " "</i>	<i>0 " "</i>	<i>"</i>	<i>"</i>
9.58.24,3	1.58	-9,14		+1.17,51	82.20.38,2	82.21.55,71	58,00	+2,29
9.59.40,0	1.56	-9,14		+1.17,17	.....	82.21.55,37	57,57	+2,20
10.1.9,8	1.55	-9,14		+1.15,48	.....	82.21.53,68	57,07	+3,39
10.2.24,6	1.54	-9,13		+1.16,35	.....	82.21.54,55	56,65	+2,10
10.3.16,5	1.53	-9,13		+1.15,08	.....	82.21.53,28	56,35	+3,07
10.4.21,3	1.52	-9,13		+1.15,18	.....	82.21.53,38	56,00	+2,62
10.5.22,0	1.51	-9,13		+1.14,85	.....	82.21.53,05	55,66	+2,61
10.6.22,8	1.50	-9,12		+1.13,98	.....	82.21.52,18	55,32	+3,14
10.8.36,5	1.48	-9,12		+1.13,99	.....	82.21.52,19	54,57	+2,38
10.9.29,3	1.47	-9,12		+1.12,69	.....	82.21.50,89	54,28	+3,39
10.10.25,2	1.46	-9,12		+1.11,73	.....	82.21.49,93	53,96	+4,03
10.11.21,0	1.45	-9,11		+1.12,45	.....	82.21.50,65	53,65	+3,00
10.12.28,8	1.44	-9,11		+1.11,61	.....	82.21.49,81	53,27	+3,46
10.13.38,6	1.42	-9,11		+1.10,51	.....	82.21.48,71	52,88	+4,17
10.14.44,5	1.41	-9,11		+1.10,58	.....	82.21.48,78	52,51	+3,73



Day 1839.	Number of Series.	Object.	Micrometer.	Micrometer Reading.	Time by Graham.	Sidereal Time.	Apparent Excess of N.P.D. of Limb of Mars above N.P.D. of $\times$ .	Diameter of Mars by observation.	Observer.
				r.	h. m. s.	h. m. s.	" "	"	
Mar. 15	46	* (s) Mars N.L.	L.	12,069	9.48.15	9.47.42			
		... S.L.	U.	10,498	9.48.22	9.47.11,2	+1.11,92 +1.27,19	15,27	G.
Mar. 27	47	* Leonis.	U.	14,384	11.58.31	11.56.11,9			
		Mars S.L.	U.	6,770			-4.14,45		
		... N.L.	L.	13,717	12.3.50	12.1.30,9	-4.32,13	17,68	G.
	48	* Leonis.	U.	14,430	12.6.29	12.4.9,9			
		Mars N.L.	L.	13,783	12.11.48	12.9.28,9	-4.35,87		G.
	49	* Leonis.	U.	14,402	12.12.44	12.10.24,9			
		Mars N.L.	L.	13,808	12.18.2	12.15.42,9	-4.35,77		G.
	50	* Leonis.	U.	14,422	12.18.53	12.16.34,0			
		Mars N.L.	L.	13,821	12.24.12	12.21.53,0	-4.36,87		G.
April 6	51	* (E) Mars N.L.	L.	13,112	12.26.1	12.24.26,8			
			U.	14,808	12.32.40	12.31.5,8	+4.26,09		G.
	52	* (E) Mars N.L.	L.	13,107	12.35.7	12.33.32,8			
			U.	14,825	12.41.48	12.40.13,8	+4.26,49		G.
	53	* (E) Mars N.L.	L.	13,873	13.2.24	13.0.49,9			
			U.	14,000	13.9.8	13.7.33,9	+4.24,53		G.

Graduated face of Declination Circle West. One micrometer revolution =  $33''/400$ . Coincidence reading of L =  $9^{\circ}9'17''$ : that of U =  $10^{\circ}04'1''$ .

N<sup>os</sup>. 47—50. The planet was not well defined.

N<sup>o</sup>. 53. Before this set was taken it was discovered that in the two preceding the Declination Circle had not been clamped.

Greenwich Mean Solar Time of Observation of Mars.	Hour angle from Meridian.	Correction for Parallax.	Correction for Semi- diameter.	Excess of N.P.D. of Mars' center above N.P.D. of $\star$ .	Assumed N.P.D. of $\star$ .	Concluded N.P.D. of Mars.	Seconds of Tabular N.P.D.	Error of Tabular N.P.D.
<i>h. m. s.</i>	<i>h. m.</i>	<i>"</i>	<i>"</i>	<i>' "</i>	<i>0 ' "</i>	<i>0 ' "</i>	<i>"</i>	<i>"</i>
10.15.29,3	1.41	-9,11		+1.10,45	82.20.38,2	82.21.48,65	52,26	+3,61
11.42.16,2	0.51	-8,61		-4.31,90	81.3.38,8	80.59.6,90	12,66	+5,76
11.50.12,8	0.58	-8,61	+7,70	-4.36,78	.....	80.59.2,02	10,88	+8,86
11.56.25,8	1.5	-8,63	+7,70	-4.36,70	.....	80.59.2,10	9,50	+7,40
12.2.34,9	1.11	-8,63	+7,70	-4.37,80	.....	80.59.1,00	8,13	+7,13
11.32.27,1	1.31	-8,17	+7,40	+4.25,32	80.16.0,4	80.20.25,72	30,27	+4,55
11.41.33,6	1.40	-8,19	+7,40	+4.25,70	.....	80.20.26,10	29,38	+3,28
12.8.49,3	2.7	-8,26	+7,40	+4.23,67	.....	80.20.24,07	26,73	+2,66



*The following results of measures of the APPARENT DIAMETER of MARS are derived from the preceding observations and calculations. The third column contains the means of the measures of the respective days.*

#### I. MEASURES WITH THE NORTHUMBERLAND EQUATOREAL.

Day of Observation 1839.	Number of Measures.	Diameter by Observation.	Tabular Diameter.	Excess of Latter.
Feb. 23	3	17,91	12,60	- 5,31
25	2	16,24	12,80	- 3,44
27	4	15,37	13,00	- 2,37
March 27	4	15,16	13,00	- 2,16
April 1	2	14,88	12,80	- 2,08
6	3	15,21	12,40	- 2,81

#### II. MEASURES WITH THE FIVE-FEET EQUATOREAL.

Day of Observation 1839.	Number of Measures.	Diameter by Observation.	Tabular Diameter.	Excess of Latter.
Feb. 25	6	16,96	12,80	- 4,16
27	5	17,13	13,00	- 4,13
March 9	6	15,52	13,20	- 2,32
11	6	17,48	13,40	- 4,08
13	5	16,63	13,40	- 3,23
15	17	15,78	13,40	- 2,38
27	1	17,68	13,00	- 4,68

DIFFERENCES  
OF  
RIGHT ASCENSION AND NORTH POLAR DISTANCE  
OF  
GALLE'S FIRST COMET  
AND NEIGHBOURING STARS,  
OBSERVED WITH THE NORTHUMBERLAND EQUATOREAL,  
AND THE FIVE-FEET EQUATOREAL;  
AND  
CALCULATION OF GEOCENTRIC RIGHT ASCENSIONS AND  
NORTH POLAR DISTANCES OF THE COMET.

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1839 AND 1840.



## I. OBSERVATIONS of RIGHT ASCENSION.

Day of Observation.	Number of Series.	Object.	Time by Chronometer X.	Sidereal Time.	Reading of Hour Circle Index.	Correction for rate of Hour Circle.	Apparent Excess of R.A. of Comet above R.A. of $\star$ .	Observer.
			<i>h. m. s.</i>	<i>h. m. s.</i>	<i>h. m. s.</i>	<i>s.</i>	<i>m. s.</i>	
1839. Dec. 29	1	Comet * (I)	13.34.9,0 13.37.22,0	13.33.30,2 13.36.43,2	11.56.51 11.56.34	+0,39	+0.16,61	C.
1840. Jan. 6	2	Comet * (II)	14.3.32,0 14.9.11,0	14.2.32,2 14.8.11,2	11.56.53 11.59.6	-3,19	-2.9,81	C.
	3	Comet * (II)	14.12.35,0 14.16.16,0	14.11.35,2 14.15.16,2	11.56.59 11.59.10	-2,08	-2.8,92	C.
Jan. 10	4	Comet * (III)	14.5.20,0 14.12.25,5	14.4.12,59 14.11.18,09			-7.5,50	C.
	5	Comet * (III)	14.19.55,0 14.26.57,5	14.18.47,57 14.25.50,06			-7.2,49	C.
	6	Comet * (III)	14.20.10,8 14.27.13,0	14.19.3,39 14.26.5,59			-7.2,20	C.

## II. OBSERVATIONS OF NORTH POLAR DISTANCE.

Day of Observation.	Number of Series.	Object.	Time by Chronometer X.	Sidereal Time.	Reading of Sector Microscope.	Apparent Excess of N.P.D. of Comet above N.P.D. of $\star$ .	Observer.
			<i>h. m. s.</i>	<i>h. m. s.</i>	<i>d. r.</i>	<i>" "</i>	
1839. Dec. 29	7	Comet * (I)	13.40.53,0 13.44.0,0	13.40.14,2 13.43.21,2	23.14,410 22.14,581	+3.22,52	C.
	8	Comet * (I)	13.47.9,0 13.49.42,0	13.46.30,2 13.49.3,2	23.15,313 22.15,233	+3.25,07	C.
1840. Jan. 6	9	Comet * (II)	14.21.25,0 14.25.57,0	14.20.25,2 14.24.57,2	18.18,692 18.4,008	+2.29,45	C.
Jan. 10	10	Comet * (III)	14.5.20,0 14.12.25,5	14.4.12,6 14.11.18,1	17.1,644 18.0,135	-3.8,90	C.
	11	Comet * (III)	14.19.55,0 14.26.57,5	14.18.47,6 14.25.50,1	17.3,180 18.1,403	-3.6,17	C.
Jan. 17	12	Comet * (V)	14.40.46,0 14.45.36,0	14.39.23,3 14.44.13,3	15.13,360 19.11,178	-13.14,83	C.
Jan. 26	13	Comet * (VII)	15.8.55,0 15.12.12,0	15.7.5,6 15.10.22,6	12.3,692 24.3,309	-40.47,84	C.

The illuminated side of the Telescope was West. The interval (*d*) between the Sector divisions = 204'',258. One revolution (*r*) of the sector-microscope micrometer = 10'',178.

N<sup>o</sup>. 1. By comparisons with X immediately after the observations, the Hour Circle lost 1<sup>s</sup> in 8<sup>m</sup>.20<sup>s</sup>, whence the correction for its rate is deduced. The star (I) is of the 8th or 9th magnitude, and was alone in the field.

N<sup>os</sup>. 2 and 3. The rate of the Hour Circle is found from the Hour Circle readings for the star, and is probably not very accurate. The observations of Jan. 6 were considered good: day-light prevented taking more. The star (II) is of the 8th magnitude and stands alone.

N<sup>os</sup>. 4 and 5 are transits at the fixed vertical wire, the instrument being fixed. In N<sup>o</sup>. 6, the times are

## I. CALCULATION OF GEOCENTRIC RIGHT ASCENSIONS.

Approximate Hour Angle East from the Meridian.	Approximate N.P.D. of object.	Correction for Refraction in R.A.	Correction for Parallax in R.A.	Assumed R.A. of $\star$ .	Concluded R.A. of Comet.	Greenwich Mean Solar Time of Observation of the Comet.	Interpolated R.A. of Comet.	Error of Interpolated R.A.
<i>h. m. s.</i>	<i>o. ' "</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	<i>h. m. s.</i>	<i>h. m. s.</i>	<i>h. m. s.</i>	<i>s.</i>
3. 12. 1 3. 8. 31	86. 45,7 86. 42,7	+ 0,08	- 0,27	16. 45. 13,72	16. 45. 30,14	19. 0. 57,3	16. 45. 30,77	+ 0,63
3. 36. 32 3. 33. 3	88. 1,7 87. 59,2	+ 0,12	- 0,25	17. 41. 14,00	17. 39. 4,06	18. 58. 27,2	17. 39. 6,07	+ 2,01
3. 27. 30 3. 25. 58	88. 1,8 87. 59,2	+ 0,05	- 0,24	.....	17. 39. 4,89	19. 7. 28,7	17. 39. 8,33	+ 3,44
3. 57. 38	88. 59,5 89. 2,8	- 0,02	- 0,25	18. 8. 56,15	18. 1. 50,38	18. 44. 23,7	18. 1. 51,31	+ 0,93
3. 43. 6	88. 59,7 89. 2,8	- 0,02	- 0,24	.....	18. 1. 53,40	18. 58. 56,3	18. 1. 54,59	+ 1,19
3. 42. 50	88. 59,7 89. 2,8	- 0,02	- 0,24	.....	18. 1. 53,69	18. 59. 12,0	18. 1. 54,65	+ 0,96

## II. CALCULATION OF GEOCENTRIC NORTH POLAR DISTANCES.

Approximate Hour Angle East from the Meridian.	Approximate N.P.D. of object.	Correction for Refraction in N.P.D.	Correction for Parallax in N.P.D.	Assumed N.P.D. of $\star$ .	Concluded N.P.D. of Comet.	Greenwich Mean Solar Time of Observation of the Comet.	Interpolated N.P.D. of Comet.	Error of Interpolated N.P.D.
<i>h. m. s.</i>	<i>o. ' "</i>	<i>"</i>	<i>"</i>	<i>o. ' "</i>	<i>o. ' "</i>	<i>h. m. s.</i>	<i>o. ' "</i>	<i>"</i>
3. 5. 19 3. 1. 53	86. 45,8 86. 42,7	+ 1,63	- 6,68	86. 42. 39,24	86. 45. 56,71	19. 7. 40,2	86. 45. 46,13	- 10,58
2. 59. 5 2. 56. 11	86. 45,8 86. 42,7	+ 1,32	- 6,67	.....	86. 45. 58,96	19. 13. 55,1	86. 45. 47,41	- 11,55
3. 18. 45 3. 16. 17	88. 1,9 87. 59,2	+ 1,50	- 5,83	87. 59. 14,53	88. 1. 39,65	19. 16. 17,3	88. 1. 53,99	+ 14,34
3. 57. 38	88. 59,5 89. 2,8	- 0,43	- 5,48	89. 2. 46,52	88. 59. 31,71	18. 44. 23,7	88. 59. 29,59	- 2,12
3. 43. 6	88. 59,6 89. 2,8	- 0,35	- 5,48	.....	88. 59. 34,52	18. 58. 56,3	88. 59. 38,98	+ 4,46
3. 57. 18 3. 53. 59	90. 54,2 91. 7,6	+ 2,03	- 4,95	91. 7. 37,47	90. 54. 19,72	18. 51. 57,2	90. 54. 10,06	- 9,66
4. 6. 52 4. 3. 45	93. 20,3 94. 1,1	- 3,20	- 4,43	94. 1. 7,02	93. 20. 11,55	18. 44. 11,8	93. 20. 19,87	+ 8,32

those of reappearance of the comet and star at the straight edge of the comb, the instrument being in the same position as in N<sup>o</sup>. 5. After the star observations of N<sup>os</sup>. 5 and 6 the counting was found 10<sup>s</sup> in advance, and the times are altered accordingly. Also being doubtful at the time of observation whether the seconds of the comet observation of N<sup>o</sup>. 6 should be 10 or 11, I put 10 conjecturally. The star (III) is of the 7th or 8th magnitude.

In N<sup>os</sup>. 7 and 8 the sector divisions have been altered from 24 to 23, and in N<sup>o</sup>. 12, from 18 to 19. The even divisions only of the sector are numbered, and hence probably the mistakes arose.

In N<sup>os</sup>. 10 and 11 the instrument was fixed and the times of observation are the same as in N<sup>os</sup>. 4 and 5.

N<sup>o</sup>. 12. The star (V) is a pretty double star. The comet was too faint for more observations.

N<sup>o</sup>. 13. The Hour Circle clock failing, no observation of  $\mathcal{R}$  could be taken. Star (VII) is of the 7th magnitude and followed the comet a few seconds.



Day of Observa- tion.	No. of Series.	Object.	Times by Graham of Observation at							Correction to Mean of Observed Times.	Concluded Time of Transit by Clock.	Corresponding Sidereal Time.	Observer.
			Entrance.  s.	Wire I.  s.	II.  s.	III.  s.	IV.  s.	V.  s.	Departure.  h. m. s.				
1839. Dec. 27	1	Comet 21 Ophiuchi	26,0	54,0		14,5		35,0 19,0	12 . 0 . 12 . 14 .	- 27,94	12 . 0 . 2,37 12 . 13 . 56,31	11 . 55 . 9,09 12 . 9 . 3,01	C.
	2	Comet 21 Ophiuchi		52,0 19,5		12,8 40,1		34,0 1,7	12 . 29 . 12 . 43 .		12 . 29 . 12,93 12 . 42 . 40,43	12 . 24 . 19,60 12 . 37 . 47,08	C.
	3	Comet 1 Ophiuchi		52,0 16,0		13,0 36,7		34,3 57,8	13 . 8 . 13 . 15 .		13 . 8 . 13,10 13 . 15 . 36,83	13 . 3 . 19,71 13 . 10 . 43,43	C.
	4	Comet 1 Ophiuchi		54,7 5,4		16,0 26,4		37,3 47,5	13 . 25 . 13 . 32 .		13 . 25 . 16,00 13 . 32 . 26,43	13 . 20 . 22,59 13 . 27 . 33,01	C.
	5	Comet 1 Ophiuchi		11,0 16,2		31,7 37,0		53,3 58,3	13 . 39 . 13 . 46 .		13 . 39 . 32,00 13 . 46 . 37,17	13 . 34 . 38,57 13 . 41 . 43,73	C.
Dec. 28	6	Comet 30 Ophiuchi		23,0 29,0		44,0 50,2		5,2 11,3	12 . 3 . 12 . 18 .		12 . 2 . 44,07 12 . 17 . 50,17	11 . 57 . 48,83 12 . 12 . 54,91	C.
	7	Comet 21 Ophiuchi		43,5 24,0		4,4 45,0		25,8 6,0	12 . 26 . 12 . 32 .		12 . 26 . 4,57 12 . 31 . 45,00	12 . 21 . 9,30 12 . 26 . 49,72	C.
	8	Comet 21 Ophiuchi		33,8 10,0			5,8	17,0 51,8	12 . 43 . 12 . 48 .	+ 3,52	12 . 42 . 58,87 12 . 48 . 34,35	12 . 38 . 3,57 12 . 43 . 39,05	C.
	9	Comet 21 Ophiuchi		18,8 51,0		39,0 11,8		0,0 33,0	12 . 55 . 13 . 0 .		12 . 54 . 39,27 13 . 0 . 11,93	12 . 49 . 43,96 12 . 55 . 16,61	C.
Dec. 29	10	Comet 30 Ophiuchi	49,0						12 . 25 . 48,0 12 . 32 . 56,0	- 59,74	12 . 24 . 48,50 12 . 31 . 56,26	12 . 19 . 51,21 12 . 26 . 58,96	C.
	11	Comet 30 Ophiuchi	54,0			5,5			12 . 46 . 53,6 12 . 54 . 14,8		- 24,87	12 . 45 . 53,80 12 . 53 . 15,28	12 . 40 . 56,48 12 . 48 . 17,95
1840. Jan. 1	12	Comet 41 Ophiuchi		14,0 18,6		34,8 39,4		56,2 0,6	13 . 46 . 13 . 54 .		13 . 46 . 35,00 13 . 53 . 39,53	13 . 41 . 24,32 13 . 48 . 28,83	C.
	13	Comet 41 Ophiuchi		40,0		1,0		22,0	14 . 4 . 14 . 6 . 31,0	- 69,53	14 . 4 . 1,00 14 . 5 . 21,47	13 . 58 . 50,25 14 . 0 . 10,72	C.
Jan. 2	14	41 Ophiuchi Comet		38,7		59,3 59,2		20,8 21,0	12 . 22 . 12 . 27 .		+ 10,52	12 . 22 . 10,12 12 . 27 . 10,10	12 . 16 . 54,43 12 . 21 . 54,41
	15	41 Ophiuchi Comet		51,0 56,3		11,7 17,0		32,3 39,0	12 . 43 . 12 . 48 .	12 . 43 . 11,67 12 . 48 . 17,43		12 . 37 . 55,93 12 . 43 . 1,68	C.
Jan. 6	16	$\beta$ Ophiuchi Comet		16,4 30,0		37,3 51,3		58,6 12,4	12 . 54 . 12 . 58 .		12 . 54 . 37,43 12 . 57 . 51,23	12 . 49 . 8,27 12 . 52 . 22,07	C.

Nº. 1. The star was observed very hurriedly: probably there was an error of 20<sup>s</sup> in counting.

Nºs. 2 and 3. Some error in these for which I cannot account. Between the observations of Nº. 3 the handle of the Hour Circle fell.

Nº. 5. Day-light interrupted the observations. The comet was very distinctly visible this morning, and had a well-defined disc.

Nº. 6. The comet was faint. 30 Ophiuchi is rather too distant a star for accurate comparison.

Nº. 10. The observation of the star was hurried, the shutter being in the way. It can scarcely be doubted that there was a mistake of 20<sup>s</sup> in counting.

Nº. 11. The comet this morning was exceedingly faint and the observations of it are very doubtful. By two observations of 30 Ophiuchi immediately after the above, the interval from entrance to the middle wire was found to be 49<sup>s</sup>.8. This value is used in calculating the corrections to the mean of observed times.

Apparent excess of R.A. of Comet above R.A. of $\star$ .	Approximate Hour angle East from the Meridian.	Approximate N.P.D. of Object.	Correc- tion for Refraction in R.A.	Correc- tion for Paral- lax in R.A.	Assumed R.A. of $\star$ .	Concluded R.A. of Comet.	Greenwich Mean Solar Time of Observation of the Comet.	Interpolated R.A. of Comet.	Error of Inter- polated R.A.
m. s.	h. m. s.	o. l.	s.	s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	s.
- 13. 53,92	4. 34. 14	86. 38,5 88. 30,5	- 0,81	- 0,35	16. 43. 17,37	16. 29. 22,29	17. 30. 44,1	16. 29. 44,09	(+ 21,80) + 1,80
- 13. 27,48	4. 5. 30	86. 38,6 88. 30,5	- 0,48	- 0,33	.....	16. 29. 49,08	17. 59. 49,8	16. 29. 53,61	(+ 4,53)
- 7. 23,72	3. 26. 38	86. 38,6 88. 41,0	- 0,30	- 0,29	16. 37. 21,30	16. 29. 56,99	18. 38. 43,6	16. 30. 6,33	(+ 9,34)
- 7. 10,42	3. 9. 48	86. 38,7 88. 41,0	- 0,24	- 0,28	.....	16. 30. 10,36	18. 55. 43,6	16. 30. 11,88	+ 1,52
- 7. 5,16	2. 55. 37	86. 38,7 88. 41,0	- 0,20	- 0,26	.....	16. 30. 15,68	19. 9. 57,3	16. 30. 16,53	+ 0,85
- 15. 6,08	4. 39. 42	86. 41,3 93. 58,7	- 5,40	- 0,34	16. 52. 36,74	16. 37. 24,92	17. 29. 27,5	16. 37. 28,99	+ 4,07
- 5. 40,42	4. 16. 27	86. 41,3 88. 30,5	- 0,58	- 0,33	16. 43. 17,40	16. 37. 36,07	17. 52. 44,1	16. 37. 36,41	+ 0,34
- 5. 35,48	3. 59. 38	86. 41,4 88. 30,5	- 0,44	- 0,32	.....	16. 37. 41,16	18. 9. 35,6	16. 37. 41,79	+ 0,63
- 5. 32,65	3. 48. 0	86. 41,4 88. 30,5	- 0,36	- 0,31	.....	16. 37. 44,08	18. 21. 14,1	16. 37. 45,50	+ 1,42
- 7. 7,75	4. 25. 38	86. 45,5 93. 58,7	- 3,64	- 0,33	16. 52. 36,76	16. 45. 25,04	17. 47. 30,4	16. 45. 7,97	(- 17,07) + 2,93
- 7. 21,47	4. 4. 19	86. 45,6 93. 58,7	- 2,50	- 0,31	.....	16. 45. 12,48	18. 8. 32,2	16. 45. 14,50	+ 2,02
- 1. 20,47	3. 8. 12	87. 6,3 90. 15,7	- 0,38	- 0,25	17. 8. 23,20	17. 7. 2,10	19. 14. 25,4	17. 7. 2,49	+ 0,39
+ 4. 59,98	4. 51. 29	90. 15,7 87. 14,8	- 2,21	- 0,32	17. 8. 23,23	17. 13. 20,68	17. 33. 49,6	17. 13. 21,04	+ 0,36
+ 5. 5,75	4. 30. 27	90. 15,7 87. 14,9	- 1,37	- 0,31	.....	17. 13. 27,30	17. 54. 53,4	17. 13. 26,92	- 0,38
+ 3. 13,80	4. 46. 25	85. 21,8 88. 1,1	+ 1,38	- 0,29	17. 35. 33,41	17. 38. 48,30	17. 48. 28,6	17. 38. 48,55	+ 0,25

N<sup>os</sup>. 12 and 13. These observations were hurried, day-light coming on. In the first set, the star having passed, the instrument was moved about the polar axis for the N.P.D. observation: in the other, the counting for the star was not taken from the clock and was found to be 19<sup>s</sup> in defect. This difference is applied to the observed time. By an observation of 41 Ophiuchi immediately after N<sup>o</sup>. 13 the interval from middle wire to departure was found to be 69<sup>s</sup>.5, which is used in correcting to the mean of the observed times of the comet.

N<sup>o</sup>. 15. The eye-glass was dim and the comet seen faintly. Wires III. and V. were confused; the former was written down 27<sup>s</sup>.0.

N<sup>o</sup>. 16. The comet faint. The seconds in the observation of the star were not taken from the clock and were found 27<sup>s</sup> in advance. This is allowed for.



Day of Observation.	No. of Series.	Object.	Times by Graham of Observation at							Correction to Mean of Observed Times.	Concluded Time of Transit by Clock.	Corresponding Sidereal Time.	Observer.
			Entrance.	Wire I.	II.	III.	IV.	V.	Departure.				
1840.			s.	s.	s.	s.	s.	s.	h. m. s.	s.	h. m. s.	h. m. s.	
Jan. 6	17	$\beta$ Ophiuchi Comet		50,2 8,0		11,0 28,7		32,3 49,4	13. 9. 13. 12.		13. 9. 11,17 13. 12. 28,70	13. 3. 41,99 13. 6. 59,52	C.
	18	Comet * (II)		43,5 3,4		4,0 24,5		25,7 45,2	13. 22. 13. 24.		13. 22. 4,40 13. 24. 24,37	13. 16. 35,20 13. 18. 55,17	C.
	19	Comet * (II)		52,8 10,0		14,0 31,0		35,2 51,9	13. 32. 13. 34.		13. 32. 14,00 13. 34. 30,97	13. 26. 44,78 13. 29. 1,75	C.
Jan. 10	20	Comet * (III)	46,0			39,0 46,0			13. 29. 13. 36.	- 24,29	13. 29. 12,50 13. 36. 21,71	13. 23. 41,05 13. 30. 50,26	G.
	21	Comet * (III)	54,0 9,0	25,0		45,8 56,5		5,0	13. 40. 13. 46.	+ 12,18	13. 39. 32,45 13. 46. 44,93	13. 34. 1,00 13. 41. 13,47	G.
	22	Comet * (III)	20,0 31,0	51,0 59,0		10,8 19,8		30,8 41,5	13. 50. 13. 57.		13. 49. 58,15 13. 57. 7,83	13. 44. 26,69 13. 51. 36,37	G.
	23	Comet * (III)	29,0 38,0	57,5 6,0		18,6 26,7		39,6 47,6	14. 0. 14. 7.		14. 0. 6,18 14. 7. 14,58	13. 54. 34,71 14. 1. 43,11	G.
	24	70 Ophiuchi Comet	3,0 34,0	31,0 2,6		52,0 24,0		13,6 44,7	14. 14. 14. 18.		14. 13. 39,90 14. 18. 11,33	14. 8. 8,43 14. 12. 39,85	G.
	25	70 Ophiuchi Comet	3,0	55,0 29,0		15,6 50,0		37,0 11,2	14. 25. 14. 30.	- 12,18	14. 25. 3,69 14. 29. 38,30	14. 19. 32,21 14. 24. 6,81	G.
Jan. 15	26	Comet * (IV)	26,0		5,0	15,0 24,0	25,8		14. 4. 14. 6.	- 12,09	14. 4. 2,95 14. 6. 11,91	13. 58. 27,92 14. 0. 36,88	G.
	27	Comet * (IV)	10,0 21,0	39,5 48,0		1,0 8,6		23,6 30,0	14. 11. 14. 13.		14. 10. 48,53 14. 12. 56,90	14. 5. 13,48 14. 7. 21,85	G.
	28	Comet * (IV)	39,0 45,0	7,0 13,2	23,3	27,0 33,6	44,0	48,0 54,9	14. 16. 14. 18.	- 4,07	14. 16. 15,25 14. 18. 21,60	14. 10. 40,19 14. 12. 46,54	G.
	29	Comet * (IV)	58,0	26,0 32,0		47,0 52,5		9,0 13,8	14. 21. 14. 23.	- 12,15	14. 20. 35,00 14. 22. 40,62	14. 14. 59,94 14. 17. 5,56	G.
	30	Comet * (IV)	25,0 29,0	51,0 57,6		13,0 18,0		34,6 39,3	14. 25. 14. 27.		14. 25. 0,90 14. 27. 5,98	14. 19. 25,83 14. 21. 30,91	G.
	31	$\epsilon$ Serpentis Comet * (IV)		12,0 54,0		32,8 12,0 14,7		54,0 36,0	14. 33. 14. 37. 14. 39.	- 0,04 - 0,04	14. 33. 32,89 14. 37. 12,00 14. 39. 14,86	14. 27. 57,80 14. 31. 36,90 14. 33. 39,76	G.
Jan. 17	32	Comet * (V)	22,0 0,0						14. 23. 23,0 14. 25. 0,0		14. 22. 22,50 14. 24. 0,00	14. 16. 38,47 14. 18. 15,97	G.
	33	Comet * (V)	30,0 7,0			20,0 54,0			14. 29. 14. 30.		14. 28. 55,00 14. 30. 30,50	14. 23. 10,95 14. 24. 46,45	G.
	34	Comet * (V)	10,0 47,0		25,0	3,0			14. 34. 14. 35.	+ 5,17	14. 33. 36,50 14. 35. 11,17	14. 27. 52,43 14. 29. 27,10	G.
	35	Comet $\iota$ Aquilæ	14,0			8,0			14. 40. 14. 43. 21,0	- 94,38	14. 39. 41,00 14. 41. 46,62	14. 33. 56,91 14. 36. 2,53	G.

Nº. 17. Wire V. for the comet has been diminished 10<sup>s</sup> by a consideration of the intervals.

Nº. 20. The noted time for the comet has been increased 2<sup>m</sup>. The observer was aware that this his first observation of the comet was of no value. The comet to day was very bright.

Nº. 26. The comet not so bright this morning as on the 10th, and more diffused about the nucleus.

Apparent excess of R.A. of Comet above R.A. of $\star$ .	Approximate Hour angle East from the Meridian.	Approximate N.P.D. of Object.	Correc- tion for Refraction in R.A.	Correc- tion for Parallax in R.A.	Assumed R.A. of $\star$ .	Concluded R.A. of Comet.	Greenwich Mean Solar Time of Observation of the Comet.	Interpolated R.A. of Comet.	Error of Inter- polated R.A.
m. s.	h. m. s.	o. /	s.	s.	h. m. s.	h. m. s.	h. m. s.	h. m. s.	s.
+ 3.17,53	4.31.51	85.21,8 88.1,2	+1,03	-0,29	17.35.33,41	17.38.51,68	18.3.3,6	17.38.52,20	+0,52
- 2.19,97	4.22.19	88.1,3 87.59,2	+0,02	-0,28	17.41.14,00	17.38.53,77	18.12.37,7	17.38.54,60	+0,83
- 2.16,97	4.12.12	88.1,4 87.59,2	+0,02	-0,28	.....	17.38.56,77	18.22.45,6	17.38.57,14	+0,37
- 7.9,21	4.38.6	88.59,1 89.2,8	-0,05	-0,27	18.8.56,15	18.1.46,62	18.3.58,8	18.1.42,19	(-4,43)
- 7.12,47	4.27.43	88.59,2 89.2,8	-0,04	-0,26	.....	18.1.43,38	18.14.17,0	18.1.44,52	+1,14
- 7.9,68	4.17.20	88.59,3 89.2,8	-0,03	-0,26	.....	18.1.46,18	18.24.41,0	18.1.46,87	+0,69
- 7.8,40	4.7.13	88.59,4 89.2,8	-0,02	-0,25	.....	18.1.47,48	18.34.47,4	18.1.49,15	+1,67
+ 4.31,42	3.49.13	87.27,6 88.59,6	+0,34	-0,24	17.57.21,23	18.1.52,75	18.52.49,5	18.1.53,21	+0,46
+ 4.34,60	3.37.49	87.27,6 88.59,7	+0,29	-0,23	.....	18.1.55,89	19.4.14,6	18.1.55,79	-0,10
- 2.8,96	4.28.45	90.20,3 90.26,5	-0,07	-0,24	18.29.22,16	18.27.12,89	18.19.0,4	18.27.13,27	+0,38
- 2.8,37	4.22.0	90.20,4 90.26,5	-0,06	-0,24	.....	18.27.13,49	18.25.44,8	18.27.14,61	+1,12
- 2.6,35	4.16.35	90.20,4 90.26,5	-0,05	-0,24	.....	18.27.15,52	18.31.10,7	18.27.15,70	+0,18
- 2.5,62	4.12.16	90.20,5 90.26,5	-0,05	-0,24	.....	18.27.16,25	18.35.29,7	18.27.16,56	+0,31
- 2.5,08	4.7.51	90.20,5 90.26,5	-0,05	-0,23	.....	18.27.16,80	18.39.54,9	18.27.17,44	+0,64
+ 3.39,10 - 2.2,86	3.55.42 3.55.42	91.6,8 90.20,7 90.26,5	-0,23 -0,04	-0,23	18.23.40,90 18.29.22,16	18.27.19,54 18.27.19,03	18.52.3,9	18.27.19,86	+0,32 +0,83
- 1.37,50	4.19.56	90.53,9 91.7,6	-0,14	-0,23	18.38.12,17	18.36.34,30	18.29.16,1	18.36.36,60	+2,30
- 1.35,50	4.13.26	90.54,0 91.7,6	-0,13	-0,23	.....	18.36.36,31	18.35.47,5	18.36.37,84	+1,53
- 1.34,67	4.8.45	90.54,0 91.7,6	-0,12	-0,23	.....	18.36.37,15	18.40.28,3	18.36.38,73	+1,58
- 2.5,62	4.2.37	90.54,1 94.54,9	-1,75	-0,22	18.38.40,48	18.36.32,89	18.46.31,7	18.36.39,88	+6,99

N°. 28. The minutes for the observation of the star were written down 19.

N°. 32. This morning's observations not satisfactory, the comet being often faint from clouds, and the lamp light bad. From this day the observations are less worthy of confidence than those preceding, on account of the increasing indistinctness of the comet.



Day of Observation.	No. of Series.	Object.	Times by Graham of Observation at							Correction to Mean of Observed Times.	Concluded Time of Transit by Clock.	Corresponding Sidereal Time.	Observer.
			Entrance.	Wire I.	II.	III.	IV.	V.	Departure.				
1840.			s.	s.	s.	s.	s.	s.	h. m. s.	s.	h. m. s.	h. m. s.	
Jan. 17	36	Comet <i>l</i> Aquilæ	24,0 25,0						14.50. 14.52.		14.50.24,00 14.52.25,00	14.44.39,88 14.46.40,88	G.
Jan. 21	37	* (VI) Comet	19,0 26,0			6,0 12,0			14.28. 14.34.		14.27.42,50 14.33.49,00	14.21.34,49 14.27.40,98	G.
	38	* (VI) Comet	45,0 52,0			35,0 40,0			14.39. 14.45.		14.39.10,00 14.45.16,00	14.33.1,96 14.39.7,93	G.
	39	* (VI) Comet	27,0 35,0			16,0 24,0			14.49. 14.55.		14.48.51,50 14.54.59,50	14.42.43,42 14.48.51,39	G.
Jan. 26	40	<i>f</i> Aquilæ Comet	50,0			40,0 40,0			14.36. 14.38.	+24,41	14.36.39,41 14.38.40,00	14.30.6,46 14.32.7,05	G.
	41	<i>f</i> Aquilæ Comet	49,0			39,0			14.43.48,0 14.45.45,0	+63,00	14.43.48,33 14.45.45,00	14.37.15,35 14.39.12,02	G.
	42	<i>f</i> Aquilæ Comet	26,0			16,0 17,0			14.57.26,0 14.59.25,0	+27,96	14.56.50,63 14.58.51,00	14.50.17,61 14.52.17,98	G.
	43	<i>f</i> Aquilæ Comet	38,0			27,0 26,0			15.2.39,0 15.4.35,0	+27,96	15.2.2,63 15.4.0,50	14.55.29,60 14.57.27,47	G.
	44	<i>f</i> Aquilæ Comet	40,0			28,0 32,0			15.7.38,0 15.9.35,0	+27,96	15.7.3,29 15.9.3,50	15.0.30,25 15.2.30,46	G.
Jan. 29	45	Comet <i>P</i> Aquilæ	47,0 12,0			37,0 1,0			14.57. 15.2.		14.57.12,00 15.1.36,50	14.50.31,78 14.54.56,28	G.
	46	Comet <i>P</i> Aquilæ	19,0 37,0			5,0 25,0			15.6. 15.10.		15.5.42,00 15.10.1,00	14.59.1,77 15.3.20,77	G.
	47	Comet <i>P</i> Aquilæ	58,0 21,0			49,0 10,0			15.14.57,0 15.19.20,0		15.13.54,67 15.18.17,00	15.7.14,44 15.11.36,76	G.

N°. 37. Worth nothing, the comet being hardly visible.

N°. 38 and 39. These were more satisfactory than N°. 37. The observations could not be continued on account of the disturbed state of the atmosphere and brightness of the Moon, which rendered the comet very faint.

Apparent excess of R.A. of Comet above R.A. of $\star$ .	Approximate Hour angle East from the Meridian.	Approximate N.P.D. of Object.	Correc- tion for Refrac- tion in R.A.	Correc- tion for Paral- lax in R.A.	Assumed R.A. of $\star$ .	Concluded R.A. of Comet.	Greenwich Mean Solar Time of Observation of the Comet.	Interpolated R.A. of Comet.	Error of Inter- polated R.A.
<i>m. s.</i>	<i>h. m. s.</i>	<i>o. l.</i>	<i>s.</i>	<i>s.</i>	<i>h. m. s.</i>	<i>h. m. s.</i>	<i>h. m. s.</i>	<i>h. m. s.</i>	<i>s.</i>
- 2. 1,00	3. 51. 59	90. 54,2 94. 54,9	- 1,44	- 0,22	18. 38. 40,48	18. 36. 37,82	18. 57. 12,9	18. 36. 41,92	+ 4,10
+ 6. 6,49	4. 26. 29	92. 0,2 92. 0,4	0,00	- 0,22	18. 48. 3,36	18. 54. 9,63	18. 24. 33,2	18. 54. 4,61	- 5,02
+ 6. 5,97	4. 15. 1	92. 0,2 92. 0,5	0,00	- 0,22	.....	18. 54. 9,11	18. 35. 58,3	18. 54. 6,60	- 2,51
+ 6. 7,97	4. 5. 20	92. 0,2 92. 0,6	0,00	- 0,21	.....	18. 54. 11,12	18. 45. 40,1	18. 54. 8,28	- 2,84
+ 2. 0,59	4. 41. 54	95. 42,7 93. 20,0	- 3,24	- 0,21	19. 11. 59,83	19. 13. 56,97	18. 9. 19,0	19. 13. 52,82	- 4,15
+ 1. 56,67	4. 34. 45	95. 42,7 93. 20,0	- 2,61	- 0,21	.....	19. 13. 53,68	18. 16. 22,8	19. 13. 53,93	+ 0,25
+ 2. 0,37	4. 21. 42	95. 42,7 93. 20,2	- 1,86	- 0,21	.....	19. 13. 58,13	18. 29. 26,6	19. 13. 55,98	- 2,15
+ 1. 57,87	4. 16. 30	95. 42,7 93. 20,2	- 1,64	- 0,20	.....	19. 13. 55,86	18. 34. 35,3	19. 13. 56,79	+ 0,93
+ 2. 0,21	4. 11. 30	95. 42,7 93. 20,3	- 1,46	- 0,20	.....	19. 13. 58,38	18. 39. 37,4	19. 13. 57,58	- 0,80
- 4. 24,50	4. 34. 21	94. 5,0 95. 0,1	- 1,01	- 0,20	19. 29. 17,45	19. 24. 51,74	18. 15. 53,0	19. 24. 52,85	+ 1,11
- 4. 19,00	4. 25. 56	94. 5,1 95. 0,1	- 0,80	- 0,20	.....	19. 24. 57,45	18. 24. 21,6	19. 24. 54,11	- 3,34
- 4. 22,32	4. 17. 40	94. 5,2 95. 0,1	- 0,66	- 0,20	.....	19. 24. 54,27	18. 32. 32,9	19. 24. 55,32	+ 1,05

N<sup>os</sup>. 40—44. The light of the comet was very faint.

N<sup>os</sup>. 45—47. This morning the comet was rather brighter than when last seen.



Day of Observation.	No. of Series.	Object.	Time of Observation by Graham.	Corresponding Sidereal Time.	Pointer Reading.	Microscope or Micrometer.	Microscope or Micrometer Reading.	Correction for Error of Division.	Correction for Runs.	Concluded Reading of Declination Circle.	Apparent Excess of N.P.D. of Comet above N.P.D. of $\star$ .	Observer.
			<i>h. m. s.</i>	<i>h. m. s.</i>	<i>0 ' "</i>		<i>" "</i>	<i>" "</i>	<i>" "</i>	<i>0 ' "</i>	<i>0 ' "</i>	
1839. Dec. 27	1	Comet	11.59.54,0	11.55.07	266.35	A.	4.34,0	37,2	-4,3	266.40.41,80	-1.51.25,16 C.	
		21 Ophiuchi	12.14.19,0	12.09.25,7	268.30	B.	4.58,7	78,2	-0,2	268.32.6,96		
					A.	0.30,5	41,5	-0,5				
					B.	1.3,2	81,0	0,0				
					U.	10,614						
	2	Comet	12.28.52,0	12.23.58,7	266.40	A.	0.3,7	37,0	0,0	266.41.14,15	-1.51.36,35 C.	
		21 Ophiuchi	12.42.19,5	12.37.26,2	268.30	B.	0.29,7	77,9	0,0	268.32.50,50		
					A.	1.35,3	41,5	-1,5				
					B.	2.4,8	81,0	-0,1				
	3	Comet	13.07.52,0	13.02.58,6	266.40	A.	0.36,8	37,0	-0,6	266.41.44,85	-2.02.24,40 C.	
		1 Ophiuchi	13.15.16,0	13.10.22,6	268.40	B.	0.58,6	77,9	0,0	268.43.47,25		
					A.	2.35,4	40,5	-2,4				
					B.	3.3,2	77,9	-0,1				
	4	Comet	13.24.54,7	13.20.13	266.40	A.	0.41,6	37,0	-0,7	266.41.52,05	-2.02.33,35 C.	
		1 Ophiuchi	13.32.5,4	13.27.12,0	268.40	B.	1.8,3	77,9	0,0	268.43.55,40		
				A.	2.43,1	40,5	-2,5					
				B.	3.11,9	77,9	-0,1					
5	Comet	13.39.11,0	13.34.17,6	266.40	A.	0.54,8	37,0	-0,8	266.42.4,15	-2.01.57,90 C.		
	1 Ophiuchi	13.46.16,2	13.41.22,7	268.40	B.	1.19,5	77,9	-0,1	268.44.2,05			
				A.	2.49,5	40,5	-2,6					
				B.	3.18,9	77,9	-0,1					
Dec. 28	6	Comet	12.02.23,0	11.57.27,7	266.40	A.	2.1,3	37,0	-1,9	266.43.10,50	-7.15.25,85 C.	
		30 Ophiuchi	12.17.29,0	12.12.33,7	273.55	B.	2.26,8	77,9	-0,1	273.58.36,35		
					A.	2.21,9	38,9	-2,2				
					B.	2.55,3	78,9	-0,1				
	7	Comet	12.25.43,5	12.20.48,2	266.40	A.	2.43,8	37,0	-2,5	266.43.55,65	-1.48.44,65 C.	
		21 Ophiuchi	12.31.24,0	12.26.28,7	268.30	B.	3.15,2	77,9	-0,1	268.32.40,30		
					A.	1.22,5	41,5	-1,3				
					B.	1.57,0	81,0	-0,1				
	8	Comet	12.42.33,8	12.37.38,5	266.40	A.	2.59,5	37,0	-2,8	266.44.9,15	-1.48.48,05 C.	
		21 Ophiuchi	12.48.10,0	12.43.14,7	268.30	B.	3.26,8	77,9	-0,1	268.32.57,20		
					A.	1.42,2	41,5	-1,6				
					B.	2.11,4	81,0	-0,1				
9	Comet	12.54.18,8	12.49.23,5	266.40	A.	3.10,3	37,0	-3,0	266.44.19,40	-1.48.47,15 C.		
	21 Ophiuchi	12.59.51,0	12.54.55,7	268.30	B.	3.36,7	77,9	-0,1	268.33.6,55			
				A.	1.52,3	41,5	-1,8					
				B.	2.20,2	81,0	-0,1					
Dec. 29	10	Comet	12.23.49,0	12.18.51,7	266.45	A.	1.30,0	36,0	-1,4	266.47.41,50	-7.11.43,85 C.	
		30 Ophiuchi	12.32.56,0	12.27.58,7	273.55	B.	2.0,3	78,2	-0,1	273.59.25,35		
					A.	3.10,7	38,9	-3,0				
					B.	3.45,4	78,9	-0,2				
	11	Comet	12.44.54,0	12.39.56,7	266.45	A.	1.57,7	36,0	-1,8	266.48.9,65	-7.11.57,95 C.	
		30 Ophiuchi	12.53.5,5	12.48.8,2	273.55	B.	2.29,3	78,2	-0,1	274.0.7,60		
					A.	3.54,5	38,9	-3,7				
					B.	4.26,8	78,9	-0,2				

In all the observations the graduated face of the Declination Circle was West, the Telescope looking southward. U is the micrometer which is uppermost in this position of the instrument. The micrometer wire of U is almost exactly parallel to the fixed wire: coincidence reading = 10',041. One micrometer revolution = 33'',400.

Nº. 1. The star was bisected at the 4th wire by the micrometer wire: correction to fixed wire = +19'',11. When not otherwise expressed, the star and comet were always bisected near the 1st wire in C's observations, and at the middle wire in G's observations.

Approximate Hour angle East from the Meridian.	Approximate N.P.D. of Object.	Correction for Refraction in N.P.D.	Correction for Parallax in N.P.D.	Assumed N.P.D. of $\star$ .	Concluded N.P.D. of Comet.	Greenwich Mean Solar Time of Observation of the Comet.	Interpolated N.P.D. of Comet.	Error of Interpolated N.P.D.
<i>h. m. s.</i>	<i>° ' "</i>	<i>"</i>	<i>"</i>	<i>° ' "</i>	<i>° ' "</i>	<i>h. m. s.</i>	<i>° ' "</i>	<i>"</i>
4.34.23	86.38,5	-18,72	-7,00	88.30.29,03	86.38.38,15	17.30.35,7	86.38.32,22	-5,93
4.33.51	88.30,5							
4.5.51	86.38,6	-12,49	-7,00	.....	86.38.33,19	17.59.29,0	86.38.34,69	+1,50
	88.30,5							
3.26.58	86.38,6	-9,41	-6,95	88.40.58,71	86.38.39,95	18.38.22,6	86.38.38,06	-1,89
	88.41,0							
3.10.9	86.38,7	-8,34	-6,93	.....	86.38.40,09	18.55.22,4	86.38.39,56	-0,53
	88.41,0							
2.55.58	86.38,7	-7,63	-6,92	.....	86.38.46,26	19.9.36,4	86.38.40,82	-5,44
	88.41,0							
4.40.3	86.41,3	-119,24	-6,92	93.58.43,99	86.41.11,98	17.29.6,5	86.41.17,12	+5,21
	93.58,7							
4.16.48	86.41,3	-14,37	-6,89	88.30.29,19	86.41.23,28	17.52.23,1	86.41.20,55	-2,73
	88.30,5							
4.0.2	86.41,4	-11,67	-6,87	.....	86.41.22,60	18.9.10,6	86.41.23,00	+0,40
	88.30,5							
3.48.21	86.41,4	-10,32	-6,86	.....	86.41.24,86	18.20.53,7	86.41.24,71	-0,15
	88.30,5							
4.26.36	86.45,5	-85,09	-6,78	93.58.44,15	86.45.28,43	17.46.31,1	86.45.29,60	+1,17
4.24.38	93.58,7							
4.5.18	86.45,6	-63,19	-6,75	.....	86.45.36,26	18.7.32,6	86.45.33,86	-2,40
4.4.29	93.58,7							

N°. 6. The comet was faint, and its bisection unsatisfactory.

N°. 10. The comet was bisected at entering, and the star at departure.

N°. 11. The comet was bisected at entering, the star at middle wire. The comet was so faint this morning on account of the mistiness of the atmosphere, that it would not bear illumination of the field.



Day of Observation.	No. of Series.	Object.	Time of Observation by Graham.	Corresponding Sidereal Time.	Pointer Reading.	Micrometer or Micrometer.	Micrometer or Micrometer Reading.	Correction for Error of Division.	Correction for Runs.	Concluded Reading of Declination Circle.	Apparent Excess of N.P.D. of Comet above N.P.D. of $\times$ .	Observer.
1840.			<i>h. m. s.</i>	<i>h. m. s.</i>	<i>0 ' "</i>		<i>" "</i>	<i>" "</i>	<i>" "</i>	<i>0 ' "</i>	<i>0 ' "</i>	
Jan. 1	12	Comet	13.46.14,0	13.41.33,3	267.5	A.	3.16,4	36,9	-3,1	267.9.24,50	-3.9.6,75	C.
		41 Ophiuchi	13.53.18,6	13.48.7,9	270.15	B.	3.39,2	79,7	-0,1			
						A.	2.24,4	39,9	-2,3	270.18.31,25		
						B.	2.47,0	73,6	-0,1			
Jan. 2	13	41 Ophiuchi	12.21.38,7	12.16.23,0	270.15	A.	0.0,7	39,9	0,0	270.16.12,00	-2.59.46,55	C.
		Comet	12.26.59,2	12.21.43,5	267.15	B.	0.29,8	73,6	0,0			
						A.	0.13,4	37,7	-0,2	267.16.25,45		
						B.	0.41,0	79,0	0,0			
	14	41 Ophiuchi	12.42.51,0	12.37.35,3	270.15	A.	0.58,4	39,9	-0,0	270.17.9,35	-2.59.58,70	C.
		Comet	12.47.56,3	12.42.40,6	267.15	B.	1.27,8	73,6	-0,1			
						A.	0.58,5	37,7	-0,0	267.17.10,65		
						B.	1.27,1	79,0	-0,1			
Jan. 6	15	$\beta$ Ophiuchi	12.54.16,4	12.48.47,2	265.20	A.	2.22,0	37,1	-2,2	265.23.30,55	+2.39.1,45	C.
		Comet	12.57.30,0	12.52.0,8	268.0	B.	2.48,3	76,0	-0,1			
						A.	1.16,3	41,3	-1,2	268.2.32,00		
						B.	1.46,5	81,2	-0,1			
	16	$\beta$ Ophiuchi	13.8.50,2	13.3.21,0	265.20	A.	2.40,6	37,1	-2,5	265.23.50,30	+2.39.22,15	C.
		Comet	13.12.8,0	13.6.38,8	268.0	B.	3.9,5	76,0	-0,1			
						A.	1.56,8	41,3	-1,8	268.3.12,45		
						B.	2.27,5	81,2	-0,1			
	17	Comet $\times$ (II)	13.21.43,5 13.24.3,4	13.16.14,3 13.18.34,2		L.	10,910 14,936				+0.2.14,47	C.
	18	Comet $\times$ (II)	13.31.52,8 13.34.10,0	13.26.23,6 13.28.40,8		L.	10,466 14,472				+0.2.13,80	C.
Jan. 10	19	Comet $\times$ (III)	13.29.39,0 13.36.46,0	13.24.7,6 13.31.14,6		L.	18,447 12,018				-0.3.34,73	G.
	20	Comet $\times$ (III)	13.39.45,8 13.46.56,5	13.34.14,3 13.41.25,1		L.	17,561 11,340				-0.3.27,78	G.
	21	Comet $\times$ (III)	14.0.18,6 14.7.26,7	13.54.47,1 14.1.55,2		L.	16,262 10,498				-0.3.12,51	G.
	22	70 Ophiuchi	14.13.52,0	14.8.20,5	267.25	A.	4.3,2	38,5	-3,8	267.30.11,55	+1.31.55,35	G.
		Comet	14.18.24,0	14.12.52,6	269.0	B.	4.26,2	79,2	-0,2			
						A.	0.53,2	40,5	-0,8	269.2.6,90		
						B.	1.24,5	76,5	-0,1			
	23	70 Ophiuchi	14.25.15,6	14.19.44,1	267.25	A.	4.11,5	38,5	-3,9	267.30.19,25	+1.32.9,55	G.
		Comet	14.29.50,0	14.24.18,5	269.0	B.	4.33,4	79,2	-0,2			
						A.	1.17,9	40,5	-1,2	269.2.28,80		
						B.	1.44,0	76,5	-0,1			
Jan. 15	24	Comet $\times$ (IV.)	14.4.15,0 14.6.24,0	13.58.39,9 14.0.49,0		L.	15,808 15,231				-0.6.10,11	G.

The Micrometer L is the lower of the two when the graduated face of the Declination Circle is West, and the Telescope looks southward. One micrometer revolution =  $35''$ .400.

Nº. 12. The instrument was moved between the observations. Before day-light came on, the comet was very bright, and admitted of good illumination of the field.

Nº. 14. Comet faint and eye-glass obscured by mist.

Approximate Hour angle East from the Meridian.	Approximate N.P.D. of Object.	Correction for Refraction in N.P.D.	Correction for Parallax in N.P.D.	Assumed N.P.D. of $\times$ .	Concluded N.P.D. of Comet.	Greenwich Mean Solar Time of Observation of the Comet.	Interpolated N.P.D. of Comet.	Error of Interpolated N.P.D.
<i>h. m. s.</i>	<i>° ' "</i>	<i>"</i>	<i>"</i>	<i>° ' "</i>	<i>° ' "</i>	<i>h. m. s.</i>	<i>° ' "</i>	<i>"</i>
3.25.54 3.20.15	87. 6,2 90.15,7	-11,64	-6,35	90.15.42,42	87. 6.17,68	18.56.41,5	87. 6.11,58	-6,10
4.52. 0 4.51.39	90.15,7 87.14,8	-47,80	-6,33	90.15.42,57	87.15. 1,89	17.33.38,7	87.14.48,18	-13,71
4.30.48	90.15,7 87.14,9	-31,74	-6,31	.....	87.15. 5,82	17.54.32,4	87.14.56,58	-9,24
4.46.46	85.21,8 88. 1,1	+30,99	-5,88	85.21.47,34	88. 1.13,90	17.48. 7,4	88. 1. 5,36	-8,54
4.32.12	85.21,8 88. 1,2	+24,25	-5,87	.....	88. 1.27,87	18. 2.43,0	88. 1.13,40	-14,47
4.22.40	88. 1,3 87.59,2	+0,38	-5,86	87.59.14,53	88. 1.23,52	18.12.16,9	88. 1.18,67	-4,85
4.12.33	88. 1,4 87.59,2	+0,33	-5,86	.....	88. 1.22,80	18.22.24,5	88. 1.24,25	+1,45
4.37.41	88.59,1 89. 2,8	-0,94	-5,49	89. 2.46,52	88.59. 5,36	18. 4.25,2	88.59. 3,80	-1,56
4.27.31	88.59,2 89. 2,8	-0,78	-5,49	.....	88.59.12,47	18.14.30,3	88.59.10,30	-2,17
4. 7. 1	88.59,4 89. 2,8	-0,53	-5,48	.....	88.59.28,00	18.34.59,8	88.59.23,52	-4,48
3.49. 0	87.27,6 88.59,6	+9,47	-5,48	87.27.38,19	88.59.37,53	18.53. 2,2	88.59.35,17	-2,36
3.37.37	87.27,6 88.59,7	+8,50	-5,47	.....	88.59.50,77	19. 4.26,3	88.59.42,53	-8,24
4.28.33	90.20,3 90.26,5	-1,51	-5,09	90.26.28,11	90.20.11,40	18.19.12,4	90.20.18,26	+6,86

Nº. 15. Comet faint.

Nº. 19 and 20. The name of the micrometer was not written down: no doubt it was L.

Nº. 24. The micrometer revolutions of L were written down 16, evidently 1" in error.



Day of Observation.	No. of Series.	Object.	Time of Observation by Graham.	Corresponding Sidereal Time.	Pointer Reading.	Microscope or Micrometer.	Microscope or Micrometer Reading.	Correction for Error of Division.	Correction for Runs.	Concluded Reading of Declination Circle.	Apparent Excess of N.P.D. of Comet above N.P.D. of $\star$ .	Observer.
1840.			<i>h. m. s.</i>	<i>h. m. s.</i>	<i>0 ' "</i>		<i>' "</i>	<i>" "</i>	<i>" "</i>	<i>0 ' "</i>	<i>0 ' "</i>	
Jan. 15	25	Comet * (IV)	14. 11. 1,0 14. 13. 8,6	14. 5. 26,0 14. 7. 33,6		L. U.	15,324 15,484				- 0. 6. 2,39	G.
	26	Comet * (IV)	14. 16. 27,0 14. 18. 33,6	14. 10. 51,9 14. 12. 58,5		L. U.	14,879 15,878				- 0. 6. 0,69	G.
	27	Comet * (IV)	14. 20. 47,0 14. 22. 52,5	14. 15. 11,9 14. 17. 17,5		L. U.	14,808 15,849				- 0. 5. 57,35	G.
	28	Comet * (IV)	14. 25. 13,0 14. 27. 18,0	14. 19. 37,9 14. 21. 42,9		L. U.	14,364 16,080				- 0. 5. 50,23	G.
	29	$\epsilon$ Serpentis	14. 33. 32,8	14. 27. 57,7	271. 5	A.	2. 53,8	40,8	- 2,7	271. 9. 4,15	- 0. 45. 56,52	G.
		Comet	14. 37. 12,0	14. 31. 36,9	270. 20	B. A. B. L.	3. 18,3 4. 26,7 4. 55,0 14,365	78,2 39,5 75,6	- 0,1 - 4,2 - 0,2	270. 23. 7,63		
	30	Comet * (IV)	14. 37. 12,0 14. 39. 14,7	14. 31. 36,9 14. 33. 39,6		L. U.	14,365 15,690				- 0. 5. 37,24	G.
Jan. 17	31	Comet * (V)	14. 29. 20,0 14. 30. 54,0	14. 23. 36,0 14. 25. 10,0		L. U.	23,238 21,120				- 0. 13. 34,96	G.
	32	Comet * (V)	14. 34. 3,0 14. 35. 25,0	14. 28. 18,9 14. 29. 40,9		L. U.	22,940 21,295				- 0. 13. 31,05	G.
	33	Comet	14. 40. 8,0	14. 34. 23,9	270. 50	A.	2. 45,5	41,3	- 2,6	270. 53. 56,35	- 4. 0. 0,20	G.
		$\iota$ Aquilæ	14. 42. 32,4	14. 36. 48,3	274. 50	B. A. B.	3. 11,4 2. 44,8 3. 14,2	77,2 40,5 76,3	- 0,1 - 2,6 - 0,1	274. 53. 56,55		
	34	Comet	14. 50. 24,0	14. 44. 39,9	270. 50	A.	3. 3,3	41,3	- 2,9	270. 54. 14,90	- 3. 59. 52,35	G.
		$\iota$ Aquilæ	14. 52. 25,0	14. 46. 40,9	274. 50	B. A. B.	3. 31,0 2. 58,9 3. 21,7	77,2 40,5 76,3	- 0,1 - 2,8 - 0,1	274. 54. 7,25		
Jan. 21	35	* (VI) Comet	14. 28. 6,0 14. 34. 12,0	14. 21. 58,0 14. 28. 4,0		L. L.	12,425 12,380				+ 0. 0. 1,51	G.
	36	* (VI) Comet	14. 39. 35,0 14. 45. 40,0	14. 33. 27,0 14. 39. 31,9		L. L.	11,919 10,810				+ 0. 0. 37,04	G.
	37	* (VI) Comet	14. 49. 16,0 14. 55. 24,0	14. 43. 7,9 14. 49. 15,9		L. L.	13,147 11,899				+ 0. 0. 41,69	G.
Jan. 26	38	$f$ Aquilæ Comet	14. 36. 40,0 14. 38. 40,0	14. 30. 7,1 14. 32. 7,1	275. 35 273. 15	A. A.	3. 10,8 1. 23,2	39,2 38,4	- 3,0 - 1,3	275. 38. 47,00 273. 17. 0,30	- 2. 21. 46,70	G.
	39	$f$ Aquilæ Comet	14. 42. 39,0 14. 44. 35,3	14. 36. 6,0 14. 38. 2,3	275. 35 273. 15	A. A.	3. 46,0 2. 6,0	39,2 38,4	- 3,6 - 2,0	275. 39. 21,60 273. 17. 42,40	- 2. 21. 39,20	G.
	40	$f$ Aquilæ Comet	14. 56. 16,0 14. 58. 17,0	14. 49. 43,0 14. 51. 44,0	275. 35 273. 15	A. A.	4. 35,3 2. 53,5	39,2 38,4	- 4,3 - 2,7	275. 40. 10,20 273. 18. 29,20	- 2. 21. 41,00	G.

One Micrometer revolution =  $33''$ ,400. Coincidence reading of U with fixed wire =  $10''$ ,041. Coincidence reading of L with fixed wire at middle wire =  $9''$ ,917.

N°. 27. The micrometer reading of U was 4,849: the number of revolutions has been altered conjecturally. In several instances the number of revolutions was reckoned by mistake from the fixed wire.

N°. 29. The comet was bisected by L: correction to fixed wire =  $+148''$ ,57.

N°. 32. The star was bisected at the 2nd wire.

Approximate Hour angle East from the Meridian.	Approximate N.P.D. of Object.	Correction for Refraction in N.P.D.	Correction for Parallax in N.P.D.	Assumed N.P.D. of $\star$ .	Concluded N.P.D. of Comet.	Greenwich Mean Solar Time of Observation of the Comet.	Interpolated N.P.D. of Comet.	Error of Interpolated N.P.D.
<i>h. m. s.</i>	<i>° ' "</i>	<i>"</i>	<i>"</i>	<i>° ' "</i>	<i>° ' "</i>	<i>h. m. s.</i>	<i>° ' "</i>	<i>"</i>
4. 21. 48	90. 20,4 90. 26,5	- 1,30	- 5,09	90. 26. 28,11	90. 20. 19,33	18. 25. 57,3	90. 20. 22,95	+ 3,62
4. 16. 24	90. 20,4 90. 26,5	- 1,18	- 5,09	.....	90. 20. 21,15	18. 31. 22,4	90. 20. 26,72	+ 5,57
4. 12. 5	90. 20,5 90. 26,5	- 1,09	- 5,09	.....	90. 20. 24,58	18. 35. 41,7	90. 20. 29,72	+ 5,14
4. 7. 39	90. 20,5 90. 26,5	- 1,03	- 5,09	.....	90. 20. 31,76	18. 40. 7,0	90. 20. 32,79	+ 1,03
3. 55. 43	91. 6,8 90. 20,7	- 5,92	- 5,08	91. 6. 47,72	90. 20. 40,20	18. 52. 3,9	90. 20. 41,10	+ 9,90
3. 55. 42	90. 20,7 90. 26,5	- 0,83	- 5,08	90. 26. 28,11	90. 20. 44,96	18. 52. 3,9	90. 20. 41,10	- 3,86
4. 13. 2	90. 54,0 91. 7,6	- 2,77	- 4,95	91. 7. 37,47	90. 53. 54,79	18. 36. 12,4	90. 53. 59,06	+ 4,27
4. 8. 21 4. 8. 31	90. 54,0 91. 7,6	- 2,56	- 4,95	.....	90. 53. 58,91	18. 40. 54,7	90. 54. 2,35	+ 3,44
4. 2. 13 4. 1. 52	90. 54,1 94. 54,9	- 43,01	- 4,95	94. 54. 55,77	90. 54. 7,61	18. 46. 58,6	90. 54. 6,58	- 1,03
3. 51. 59	90. 54,2 94. 54,9	- 37,14	- 4,95	.....	90. 54. 21,33	18. 57. 12,9	90. 54. 13,74	- 7,59
4. 26. 5	92. 0,2 92. 0,4	+ 0,05	- 4,69	92. 0. 11,29	92. 0. 8,16	18. 24. 56,1	92. 0. 24,49	+ 16,33
4. 14. 36	92. 0,2 92. 0,5	+ 0,06	- 4,70	.....	92. 0. 43,69	18. 36. 22,2	92. 0. 32,32	- 11,37
4. 4. 55	92. 0,2 92. 0,6	+ 0,08	- 4,70	.....	92. 0. 48,36	18. 46. 4,5	92. 0. 38,96	- 9,40
4. 41. 53	95. 42,7 93. 20,0	- 68,73	- 4,42	95. 42. 41,59	93. 19. 41,74	18. 9. 19,0	93. 19. 57,50	+ 15,76
4. 35. 54	95. 42,7 93. 20,0	- 56,45	- 4,41	.....	93. 20. 1,53	18. 15. 13,3	93. 20. 1,29	- 0,24
4. 22. 17	95. 42,7 93. 20,2	- 41,76	- 4,42	.....	93. 20. 14,41	18. 28. 52,7	93. 20. 10,05	- 4,36

N°. 33. The star was bisected at the 5th wire.

N°. 34. Both comet and star were bisected at entering.

N°. 35. Useless, the comet being scarcely visible. Apparently an error of 1'; but on account of the faintness of the object, this is doubtful. N°. 36 was more satisfactory, and N°. 37 still better.

N°. 38. Doubtful bisection of the comet.

N°. 39. The time of bisection of the comet at the middle wire not being noted, is inferred from the time of departure. This bisection of the comet was considered more satisfactory than the preceding.



Day of Observation.	No. of Series.	Object.	Time of Observation by Graham.	Corresponding Sidereal Time.	Pointer Reading.	Microscope or Micrometer.	Microscope or Micrometer Reading.	Correction for Error of Division.	Correction for Runs.	Concluded Reading of Declination Circle.	Apparent Excess of N.P.D. of Comet above N.P.D. of $\star$ .	Observer.
1840.			<i>h. m. s.</i>	<i>h. m. s.</i>	<i>0 ' "</i>		<i>''</i> <i>r</i>	<i>"</i>	<i>"</i>	<i>0 ' "</i>	<i>0 ' "</i>	
Jan. 26	41	<i>f</i> Aquilæ Comet	15. 1. 27,0 15. 3. 26,0	14. 54. 54,0 14. 56. 53,0	275. 35 273. 15	A. A.	4. 53,0 3. 11,5	39,2 38,4	- 4,6 - 3,0	275. 40. 27,60 273. 18. 46,90	- 2. 21. 40,70	G.
	42	<i>f</i> Aquilæ Comet	15. 6. 28,0 15. 8. 32,0	14. 59. 55,0 15. 1. 59,0	275. 40 273. 15	A. A.	0. 4,8 3. 17,4	41,1 38,4	- 0,1 - 3,1	275. 40. 45,80 273. 18. 52,70	- 2. 21. 53,10	G.
Jan. 29	43	Comet	14. 57. 37,0	14. 50. 56,8	274. 0	A.	2. 6,2	39,6	- 2,0	274. 3. 19,10		
		<i>P</i> Aquilæ	15. 2. 1,0	14. 55. 20,8	274. 55	B. A. B.	2. 34,3 1. 36,3 2. 6,0	80,2 41,0 77,3	- 0,1 - 1,5 - 0,1	274. 3. 19,10 274. 57. 49,50	- 0. 54. 30,40	G.
	44	Comet	15. 6. 5,0	14. 59. 24,8	274. 0	A.	2. 19,2	39,6	- 2,2	274. 3. 32,35		
		<i>P</i> Aquilæ	15. 10. 25,0	15. 3. 44,8	274. 55	B. A. B.	2. 48,0 2. 1,8 2. 34,0	80,2 41,0 77,3	- 0,1 - 1,9 - 0,1	274. 3. 32,35 274. 58. 16,05	- 0. 54. 43,70	G.
	45	Comet	15. 13. 49,0	15. 7. 8,8	274. 0	A.	2. 51,9	39,6	- 2,7	274. 4. 5,45		
		<i>P</i> Aquilæ	15. 18. 10,0	15. 11. 29,8	274. 55	B. A. B. U.	3. 22,0 0. 7,4 0. 37,3 14,873	80,2 41,0 77,3	- 0,1 - 0,1 0,0	274. 4. 5,45 274. 59. 2,84	- 0. 54. 57,39	G.

One Micrometer revolution = 33",400. Coincidence reading of U = 10",041.

N°. 44. The observation of the comet was thought to be better than in N°. 43.

N°. 45. The comet was very faint, and the observation quite doubtful. The star was observed by mistake on the micrometer wire. Correction to fixed wire = + 161",39.

Approximate Hour angle East from the Meridian.	Approximate N.P.D. of Object.	Correction for Refraction in N.P.D.	Correction for Parallax in N.P.D.	Assumed N.P.D. of $\star$ .	Concluded N.P.D. of Comet.	Greenwich Mean Solar Time of Observation of the Comet.	Interpolated N.P.D. of Comet.	Error of Interpolated N.P.D.
<i>h. m. s.</i>	<i>° ' "</i>	<i>"</i>	<i>"</i>	<i>° ' "</i>	<i>° ' "</i>	<i>h. m. s.</i>	<i>° ' "</i>	<i>"</i>
4.17.6	95.42,7 93.20,2	-37,53	-4,43	95.42.41,59	93.20.18,93	18.34.0,9	93.20.13,34	-5,59
4.12.5	95.42,7 93.20,3	-34,07	-4,43	.....	93.20.9,90	18.39.6,0	93.20.16,60	+6,70
4.33.56	94.5,0 95.0,1	-21,83	-4,28	95.0.5,44	94.5.8,93	18.16.17,9	94.5.1,78	-7,15
4.25.32	94.5,1 95.0,1	-17,89	-4,28	.....	94.4.59,57	18.24.44,5	94.5.6,92	+7,35
4.17.47	94.5,2 95.0,1	-15,13	-4,29	.....	94.4.48,63	18.32.27,3	94.5.11,61	+22,98



## REMARKS ON THE APPEARANCE OF THE COMET.

1839. Dec. 27. I found the comet very readily by its computed place, with the 5-feet Equatoreal. Its nucleus is a well-defined round disk. (C)

Dec. 29. The head of the comet was very bright at its center, and was easily bisected. The atmosphere being misty, I could not tell the direction of the tail. (C)

1840. Jan. 1. Early in the morning the comet was bright enough to admit of illumination of the field of the 5-feet Equatoreal sufficient to see the wires distinctly. It had the appearance of nebulous light surrounding a bright center, and streaming from it in the direction of the tail. (C)

Jan. 6. In the Finder of the Northumberland Telescope (power about 18) the comet when deprived of its tail by the approach of day-light appeared exactly like a star of the 7th or 8th magnitude, and disappeared at the same time with the star (II). In the large Telescope (with power 215) the star continued visible much longer than the comet. (C)

Jan. 10. 18<sup>h</sup>. The comet's tail is now very conspicuous. The length of it as seen in the Finder of the Northumberland Telescope, I judge to be not less than 1°. Viewed in the large Telescope the luminosity of the tail is not uniform; it is brighter near the borders than along the axis, and brighter on the right hand of the axis (as seen in an inverting Telescope) than on the left. (C)

Jan. 10. The comet is about equal to a star of the 7th magnitude,—has a very firm looking nucleus, and a broad tail, extending from one edge of the field to the opposite. (G) [The field with a power of 100 is 35' across].

Jan. 15. The comet is now larger about the nucleus, and not quite so vividly bright. Its tail extends over more than the width of the field with a power of 100. (G)

Jan. 21. There is no perceptible tail, and but a small nucleus, owing probably to the disturbed state of the atmosphere, and the light of the Moon. (G)

Jan. 26. The comet had but little light about the nucleus, and no perceptible tail. The diameter of the whole visible part was not more than 2'. (G)

Jan. 29. The comet was rather brighter this morning than when last seen, and its tail was visible to the extent of half a degree. Its nucleus is smaller, and more readily affected by the approach of day-light. (G)

I made the following observations with the Northumberland Telescope for determining the angles of position of the axis of the comet's tail. These angles are measured in the usual manner; viz., as seen in the Telescope, from the lowest point of a circular field towards the right hand, and so

round the circle. The axis of the comet's tail was placed as nearly as possible parallel to a straight edge bounding one side of the field. When this edge is perpendicular to the Equatoreal direction the reading of the position circle is  $179^{\circ}$  nearly, and the reading of the circle increases with the angle of position.

Day of Observation. 1840.	Reading of Position Circle.	Angle of Position.	Remarks.
Jan. 2	$127^{\circ}.42'$ $121.42$ $122.52$	$308^{\circ}.42'$ $302.42$ $303.52$	The two last observations not so good as the first, the comet becoming fainter by mist.
Jan. 10	$140.25$ $140.23$	$321.25$ $321.23$	The tail was very distinct, and the measures were good.
Jan. 12	$146.35$ $146.0$	$327.35$ $327.0$	The second measure is not so good as the first, the tail becoming obscurer by haze.
Jan. 17	$146.20$ $148.16$	$327.20$ $329.16$	Both these extremely doubtful, the tail being so very faint.



MICROMETER MEASURES OF THE APPARENT DIAMETERS OF VENUS, JUPITER, SATURN, AND SATURN'S RING, TAKEN WITH THE DOUBLE-WIRE MICROMETER OF THE NORTHUMBERLAND EQUATOREAL.

\* \* \* During each of the following sets of Observations, the Instrument was turning about its Polar axis by regulated clock-movement. The power of the eye-piece was not noted, but is supposed to be 280.

I. APPARENT DIAMETER OF VENUS.

Approximate Mean Time of Observation, 1839.	No. of Series.	Micrometer.	Limb Observed.	Micrometer Reading.	Apparent Diameter		Mean Value by Observation.	Value in Nautical Almanac.	Excess of Latter.	Observer.
					in Micro- meter Revolutions.	in arc.				
d. h.				r.	r.	"	"	"	"	
March 26 . 3	1	A B	S N	8,782 11,859	0,625	10,61	10,61	10,80	+ 0,19	C
May 27 . 9½	2	A B	S N	11,063 9,961	1,008	17,11	16,91	14,10	- 2,81	C
	3	A B	S N	8,193 12,808	0,985	16,72				
Oct. 15 . 22	4	A B	S N	11,701 11,946	3,631	61,62	60,40	57,00	- 3,40	C
	5	A B	S N	12,139 11,427	3,550	60,24				
	6	A B	S N	12,219 11,343	3,546	60,18				
	7	A B	N S	8,805 7,648	3,563	60,46				
	8	A B	N S	8,989 7,473	3,554	60,31				
	9	A B	N S	9,202 7,320	3,494	59,29				
	10	A B	N S	9,514 6,930	3,572	60,62				
	11	A B	N S	9,256 7,189	3,571	60,60				
	12	A B	S N	13,186 10,386	3,556	60,34				
	13	A B	S N	13,355 10,217	3,556	60,34				

One Micrometer revolution = 16'',970. Coincidence reading of B = 10'',016, when A reads 10'',000.

N°. 1. In these and all the following observations of Venus, the fixed wire, which is nearly perpendicular to the moveable wires, was placed by the Position Circle so as to be parallel to the line joining the cusps.

N°. 2 and 3. Neither of these was good: Venus was low and flaring.

N°. 4—13. The cusps were too sharp for satisfactory observation. N°. 4. was considered not good. Each limb having been observed on this day the same number of times by the two wires, the coincidence reading is eliminated in the mean result.

## II. APPARENT POLAR DIAMETER OF JUPITER.

Approximate Mean Time of Observation, 1839.	No. of Series.	Micrometer.	Limb Observed.	Micrometer Reading.	Apparent Diameter		Mean Value by Observation.	Value in Nautical Almanac.	Excess of Latter.	Observer.
					in Micro- meter Revolu- tions.	in arc.				
<i>d. h.</i>				<i>r.</i>	<i>r.</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	
Feb. 25. 13 <sup>3</sup> / <sub>4</sub>	14	B	N	8,448	2,430	41,24	41,00	39,54	- 1,46	C
		A	S	13,998						
	15	B	N	8,196	2,395	40,64				
		A	S	14,215						
	16	B	N	8,109	2,427	41,19				
		A	S	14,334						
	17	B	N	8,045	2,413	40,95				
		A	S	14,384						

## III. APPARENT EQUATOREAL DIAMETER OF JUPITER.

Feb. 25 . 14 $\frac{1}{4}$	18	A	E	13,516	2,578	43,75	43,68	42,65	- 1,03	C
		B	W	9,078						
	19	A	E	13,250	2,590	43,95				
		B	W	9,356						
	20	A	E	13,056	2,554	43,34				
		B	W	9,514						
	21	A	E	13,183	2,478	(42,05)				
		B	W	9,311						

## IV. APPARENT EQUATOREAL DIAMETER OF SATURN.

May 27 . 11	22	A B	E W	15,233 5,844	1,061	18,01	18,52	18,00	- 0,52	C
	23	A B	E W	15,697 5,436	1,117	18,96				
	24	A B	E W	13,320 7,785	1,089	18,48				
	25	A B	E W	10,870 10,253	1,109	18,82				
	26	A B	E W	12,971 8,124	1,079	18,31				

One Micrometer revolution = 16'',970. Coincidence reading of B = 10'',016, when A reads 10'',000.

N<sup>os</sup>. 14—17. The moveable wires were placed parallel to Jupiter's belts.

N<sup>os</sup>. 18—21. The fixed wire was placed parallel to Jupiter's belts. The result in N<sup>o</sup>. 21, differs so much from the others that it is not used in taking the mean.

N<sup>os</sup>. 22—26. The fixed wire was placed parallel to the longest diameter of Saturn's Ring. In N<sup>o</sup>. 22, the Micrometer revolutions of B were written down 4.



## V. APPARENT EQUATOREAL DIAMETER OF SATURN'S RING.

Approximate Mean Time of Observation 1839.	No. of Series.	Micrometer.	Limb Observed.	Micrometer Reading.	Apparent Diameter		Mean Value by Observa- tion.	Value in Nautical Almanac.	Excess of Latter.	Observer.
					in Micro- meter Revolu- tions.	in arc.				
					r.	"				
May 27. 11 $\frac{1}{2}$	27	A B	E W	12,929 9,645	2,558	43,41				
	28	A B	E W	12,450 10,146	2,580	43,78	43,96	42,45	- 1,51	C.
	29	A B	E W	12,450 10,200	2,634	44,70				

One Micrometer revolution = 16'',970. Coincidence reading of B = 10'',016, when A reads 10'',000.

N<sup>os</sup>. 27—29. The fixed wire was placed parallel to the longest diameter of the Ring.

The following measures of the apparent Diameter of Venus were taken with the divided-glass eye-pieces N<sup>o</sup>. 8, power 280, and N<sup>o</sup>. 10, power 420. The two images in these eye-pieces were of unequal brightness, especially in N<sup>o</sup>. 10, and were fringed with complementary colors. Also the cusps of the planet were too sharp and ill-defined for satisfactory observation. There being no fixed wire in the eye-pieces, the separation of the images in the direction of the line joining the cusps was effected by the judgment of the eye. The moveable image was brought alternately into contact with the N. and S. limbs of the fixed image, so that the difference of two consecutive readings measures twice the diameter.

Approximate mean time of observation, 1839, Oct. 15, 23 $\frac{1}{2}$ <sup>h</sup>. Observer, C.

One micrometer revolution of N<sup>o</sup>. 8 = 17'',897. One micrometer revolution of N<sup>o</sup>. 10 = 12'',904.

Eye-piece, No. 8.		Eye-piece, No. 8.		Eye-piece, No. 10.	
Micrometer Reading.	Difference of Readings.	Micrometer Reading.	Difference of Readings.	Micrometer Reading.	Difference of Readings.
1,613	r	1,546	r	9,648	r
8,302	6,689	8,307	6,761	0,394	9,254
1,549	6,753	1,584	6,723	9,553	9,159
8,237	6,688	8,336	6,752	0,347	9,206
1,554	6,683	1,634	6,702	9,542	9,195
8,264	6,710	8,322	6,688	0,383	9,159
Mean of the differences ... 6',705		Mean of the differences ... 6',725		Mean of the differences ... 9',195	
Half the Mean..... 3',353		Half the Mean..... 3',363		Half the Mean..... 4',598	
Diameter of Venus by } ... 60'',01		Diameter of Venus by } ... 60'',19		Diameter of Venus by } ... 59'',33	
Observation		Observation		Observation	
Value in Naut. Almanac.. 57'',00		Value in Naut. Almanac.. 57'',00		Value in Naut. Almanac.. 57'',00	
Excess of the latter..... - 3'',01		Excess of the latter..... - 3'',19		Excess of the latter..... - 2'',33	

The second series of measures with N<sup>o</sup>. 8 was taken after a second adjustment of the position circle.

OCCULTATIONS

OF

FIXED STARS BY THE MOON,

WITH

THE EQUATIONS GIVEN BY THE CALCULATION  
OF THE OCCULTATIONS.

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1839.



Day of Observation 1839.	Ref. No.	Phenomenon.	Moon's Limb.	Observer.	Instrument.	Clock or Chronom.	Time noted.	Time by Hardy.	Sidereal Time.	Greenwich Mean Solar Time.
Feb. 23	1	Disappearance of 47 Geminorum	Dark	C.	Northumb. Equat.	W.	<i>h. m. s.</i> 11. 2.34,0	<i>h. m. s.</i> 9.13.26,01	<i>h. m. s.</i> 9.13.59,78	<i>h. m. s.</i> 11. 1. 1,52
...	2	Reappearance of 47 Geminorum	Bright	G.	5-feet Equatoreal	G.	10.20.38,6	10.20.32,70	10.21. 6,52	12. 7.57,26
Mar. 19	3	Disappearance of <i>b</i> Pleiadum	Dark	C.	Northumb. Equat.	W.	8. 5.12,0	7.51. 2,53	7.52. 2,00	8. 4.55,39
...	4	Disappearance of <i>g</i> Pleiadum	Dark	G.	5-feet Equatoreal	G.	7.53.34,2	7.51. 1,95	7.52. 1,42	8. 4.54,81
...	5	Disappearance of Piazzi III. 135	Dark	C.	Northumb. Equat.	W.	8. 9.30,4	7.55.21,66	7.56.21,13	8. 9.13,82
...	6	Disappearance of <i>c</i> Pleiadum	Dark	G.	5-feet Equatoreal	G.	7.57.53,7	7.55.21,42	7.56.20,89	8. 9.13,58
...	7	Reappearance of <i>b</i> Pleiadum	Bright	C.	Northumb. Equat.	W.	8.32. 2,0	8.17.57,12	8.18.56,60	8.31.45,58
...	8	Disappearance of $\eta$ Tauri	Dark	G.	5-feet Equatoreal	G.	8.39. 4,8	8.25. 1,12	8.26. 0,61	8.38.48,43
...	9	Reappearance of <i>c</i> Pleiadum	Bright	G.	5-feet Equatoreal	G.	8.27.33,8	8.25. 1,37	8.26. 0,86	8.38.48,68
Aug. 25	10	Reappearance of Uranus	Dark	C.	Northumb. Equat.	X.	8.53.14,2	8.50.41,63	8.51.41,14	9. 4.24,75
...	11	Reappearance of $\phi$ Aquarii	Dark	C.	Northumb. Equat.	X.	9.15.49,0	9. 1.51,59	9. 2.51,12	9.15.32,90
...	12	Disappearance of 96 Aquarii	Bright	G.	5-feet Equatoreal	G.	9. 4.23,3	9. 1.50,69	9. 2.50,22	9.15.32,00
...	13	Reappearance of 96 Aquarii	Dark	C.	Northumb. Equat.	W.	9.27.37,0	9.13.43,62	9.14.43,16	9.27.23,01
...	14	Reappearance of <i>d</i> Pleiadum	Bright	G.	5-feet Equatoreal	G.	9.16.10,6	9.13.37,92	9.14.37,46	9.27.17,32
...	15	Disappearance of <i>h</i> Pleiadum	Dark	C.	Northumb. Equat.	X.	19.31.17,0	19.29.26,00	19.29.37,14	9.15.26,42
...	16	Disappearance of <i>f</i> Pleiadum	Bright	G.	5-feet Equatoreal	G.	19.33.55,8	19.31.10,95	19.38.36,64	9.24.24,45
...	17	Disappearance of $\chi^3$ Capricorni	Dark	C.	Northumb. Equat.	X.	19.40.16,5	19.38.25,50	19.38.36,89	9.24.24,70
...	18	Disappearance of <i>e</i> Pleiadum	Bright	G.	5-feet Equatoreal	G.	19.41.10,6	19.38.25,75	19.38.36,89	9.24.24,70
...	19	Disappearance of <i>c</i> Pleiadum	Bright	G.	5-feet Equatoreal	G.	21.47.13,7	21.44.28,20	21.44.39,46	11.30. 6,61
...	20	Reappearance of <i>g</i> Pleiadum	Dark	G.	5-feet Equatoreal	G.	22.54.47,2	22.52. 1,37	22.52.12,69	12.37.28,78
...	21	Reappearance of <i>e</i> Pleiadum	Dark	C.	5-feet Equatoreal	G.	20.13.54,0	20.10.32,07	20.10.49,13	9.36.52,14
...	22	Reappearance of <i>c</i> Pleiadum	Dark	G.	46-inch Dollond	U.	20.11.24,5	20.10.31,50	20.10.48,56	9.36.51,57
Sept. 19	23	Reappearance of $\phi$ Aquarii	Bright	C.	5-feet Equatoreal	G.	20.34. 8,0	20.30.46,07	20.31. 3,13	9.57. 2,83
...	24	Disappearance of 96 Aquarii	Dark	G.	46-inch Dollond	U.	20.31.39,8	20.30.46,80	20.31. 3,86	9.57. 3,56
...	25	Reappearance of 96 Aquarii	Bright	C.	5-feet Equatoreal	G.	20.39.14,5	20.35.52,49	20.36. 9,56	10. 2. 8,42
...	26	Disappearance of $\mu$ Arietis	Dark	G.	5-feet Equatoreal	G.	20.36.43,9	20.35.50,83	20.36. 7,90	10. 2. 6,76
...	27	Disappearance of <i>b</i> Pleiadum	Bright	C.	5-feet Equatoreal	G.	22.14.31,2	22.11. 0,45	22.11.39,18	10.18.44,21
...	28	Reappearance of <i>e</i> Pleiadum	Bright	C.	5-feet Equatoreal	G.	4.54.51,2	4.48.24,15	4.49. 9,69	16.27.38,26
...	29	Disappearance of <i>c</i> Pleiadum	Bright	C.	5-feet Equatoreal	G.	5.20.32,5	5.14. 5,45	5.14.51,00	16.53.55,36
...	30	Reappearance of <i>g</i> Pleiadum	Dark	C.	5-feet Equatoreal	G.	5.32.19,4	5.25.52,35	5.26.37,91	17. 5. 0,34
...	31	Reappearance of <i>e</i> Pleiadum	Dark	C.	5-feet Equatoreal	G.	6. 3.13,0	5.56.45,95	5.57.31,53	17.35.48,90
...	32	Reappearance of <i>c</i> Pleiadum	Dark	C.	5-feet Equatoreal	G.	6. 6. 7,0	5.59.39,95	6. 0.25,54	17.38.42,43
Oct. 19	23	Reappearance of $\phi$ Aquarii	Bright	C.	5-feet Equatoreal	G.	20. 8.24,0	19.59.23,30	19.59.28,78	6. 8.58,21
...	24	Disappearance of 96 Aquarii	Dark	C.	5-feet Equatoreal	G.	22. 4.41,8	22. 5.40,80	22. 5.46,34	8.14.55,08
...	25	Reappearance of 96 Aquarii	Bright	C.	5-feet Equatoreal	G.	23.15. 9,5	23.16. 8,35	23.16.13,92	9.25.11,12
Nov. 19	26	Disappearance of $\mu$ Arietis	Dark	G.	5-feet Equatoreal	G.	5.42.44,3	5.40. 0,1	5.40.33,33	13.46.34,39
...	27	Disappearance of <i>b</i> Pleiadum	Bright	G.	5-feet Equatoreal	G.	5. 1.14,1	4.58.23,55	4.58.57,78	13. 1. 9,74
Dec. 24	28	Reappearance of 45 Leonis	Dark	C.	5-feet Equatoreal	G.	8.38.54,0	8.33.41,66	8.34.11,83	14.22. 7,48
...	29	Reappearance of 49 Leonis	Dark	C.	5-feet Equatoreal	W.	19. 9.30,9	13.24.37,07	13.25. 7,46	19.12.15,46

No. 1 and 2. Both were satisfactory.

No. 3. G's observation was 'good;' C's 'pretty exact.' The latter was made with the Finder of the Northumberland Equatoreal, the power of which is about 18.

No. 4. Both observations were considered accurate. C's was made with the Finder.

No. 5. The star is not in the Nautical Almanac. The disappearance was not looked for, and the time noted is probably not very exact.

No. 6. C's observation was 'good;' G's 'doubtful to  $\frac{1}{10}$  or  $\frac{2}{10}$  of a second.' After this, the occultation of *e* Pleiadum was looked for, but it proved to be a very near appulse.

No. 7. Very good. The reappearance of *g* Pleiadum was not noted, it having occurred before that of *b* Pleiadum, which in the Nautical Almanac is put first.

No. 8. Both considered good. C observed with the Finder.

No. 9. G's observation was 'not very satisfactory.' In C's the counting was found 2<sup>s</sup> slow, and the star was first seen several seconds after leaving the limb, not being looked for at the right place. The field of view being small, it was difficult to decide at what part of the limb to look for the reappearance. (I find that the large Telescope is inconvenient for observing occultations at the bright limb, on account of the great quantity of diffused light). After this observation it became cloudy.

No. 10. C's observation was 'doubtful.' The seconds were not taken from the chronometer, and the counting was found 30<sup>s</sup> in advance. This is allowed for. The planet was very faint and misty, and probably could not be seen in the Telescope of the 5-feet Equatoreal at the time of its reappearance.

No. 11. Neither of the observations was quite satisfactory.

No. 12 and 13. Good observations.

No. 14. Both were considered good.

No. 15. The observations were uncertain, the star becoming very faint when near the limb. The Dollond Telescope was shaken by the wind.

No. 16. The Moon's limb was badly defined: in other respects the observations were satisfactory.

No. 17. Thought to be very accurate.

No. 18 and 19. 'Pretty good.'

No. 20. A little doubtful. So long after the time in the Nautical Almanac that I was tired with looking.

No. 21 and 22. Very exact.

No. 23. Seen early, I believe.

No. 24. Very accurate.

No. 25. Perhaps a second or two too late.

No. 26. Fleeting clouds were rather confusing, but on the whole the observation was satisfactory.

No. 27. Faint from misty clouds, but not doubtful.

No. 28. So much mist and the star so faint that I cannot be sure I saw it as soon as it reappeared. (By calculating the occultation I find that the star was certainly seen too late. The calculation is consequently not inserted.)

No. 29. Very exact.

Disappearance of 47 Geminorum, Feb. 23,  $11^h.1^m.1^s.52 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$105^{\circ}.28'.40''.20 + 0''.6073 \times t + x''$
Moon's Geocentric N.P.D. ....	$62.17.44.53 + 0.0736 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$56.44.21 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$15.27.66 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc .....	$105.21.16.50 + e''$
Star's N.P.D. ....	$62.52.59.30 + f.$

Moon's apparent Right Ascension in arc	$105^{\circ}.7'.1''.29 + 0''.4684 \times t - 1''.2989 \times m + 1''.0096 \times x + 0''.0033 \times y$
Moon's apparent N.P.D. ....	$62.44.3.67 + 0.1109 \times t + 1.5791 \times m + 1.0136 \times y - 0.0026 \times x$
Moon's apparent Semidiameter .....	$15.40.37 - 0.0003 \times t + 0.9404 \times n.$

Apparent Distance of Star from Moon's center:

$$15'.30''.35 + 0''.7273 \{ + e - 1.0096 \times x - 0.0033 \times y - 0.4684 \times t + 1.2989 \times m \} \\ - 0''.5750 \{ + 1.0136 \times y - 0.0026 \times x + 0.1109 \times t + 1.5791 \times m \} + 0''.5766 \times f.$$

Final Equation:

$$+ 10''.02 = + 0.7273 \times e - 0.7328 \times x + 0.5766 \times f - 0.5852 \times y - 0.4041 \times t + 0.0367 \times m - 0.9404 \times n.$$

Reappearance of 47 Geminorum, Feb. 23,  $12^h.7^m.57^s.26 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$106^{\circ}.9'.16''.05 + 0''.6058 \times t + x''$
Moon's Geocentric N.P.D. ....	$62.22.46.04 + 0.0765 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$56.42.72 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$15.27.25 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc .....	$105.21.16.50 + e''$
Star's N.P.D. ....	$62.52.59.30 + f.$

Moon's apparent Right Ascension in arc	$105^{\circ}.39'.19''.84 + 0''.4984 \times t - 1''.7962 \times m + 1''.0075 \times x + 0''.0046 \times y$
Moon's apparent N.P.D. ....	$62.52.7.84 + 0.1278 \times t + 1.7618 \times m + 1.0119 \times y - 0.0035 \times x$
Moon's apparent Semidiameter .....	$15.38.34 - 0.0005 \times t + 0.9383 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.5''.57 + 0''.8888 \{ - e + 1.0075 \times x + 0.0046 \times y + 0.4984 \times t - 1.7962 \times m \} \\ - 0''.0521 \{ + 1.0119 \times y - 0.0035 \times x + 0.1278 \times t + 1.7618 \times m \} + 0''.0545 \times f.$$

Final Equation:

$$- 27''.23^* = - 0.8888 \times e + 0.8957 \times x + 0.0545 \times f - 0.0486 \times y + 0.4368 \times t - 1.6883 \times m - 0.9383 \times n.$$

\* It appears probable from this result that the noted time of observation was 30<sup>s</sup> too late.



Disappearance of *b* Pleiadum, March 19,  $8^h . 4^m . 54^s,81 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$54 . 8 . 22,05 + 0,6312 \times t + x''$
Moon's Geocentric N.P.D. ....	$65 . 46 . 50,52 - 0,1647 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$59 . 35,32 \times (1 + 0,001 \times m)$
Moon's Geocentric Semidiameter .....	$16 . 14,25 \times (1 + 0,001 \times n)$
Star's Right Ascension in arc.....	$53 . 49 . 50,85 + e''$
Star's N.P.D. ....	$66 . 23 . 44,30 + f.$

Moon's apparent Right Ascension in arc	$53^{\circ} . 32' . 10'' . 06 + 0,5586 \times t - 2,1720 \times m + 1,0051 \times x + 0,0047 \times y$
Moon's apparent N.P.D. ....	$66^{\circ} . 23' . 24,48 - 0,1089 \times t + 2,1940 \times n + 1,0099 \times y - 0,0039 \times x$
Moon's apparent Semidiameter.....	$16^{\circ} . 23,86 - 0,0006 \times t + 0,9839 \times n.$

Apparent Distance of Star from Moon's center:

$$16' . 12'',22 + 0'',9160 \{ + e - 1,0051 \times x - 0,0047 \times y - 0,5586 \times t + 2,1720 \times m \} \\ - 0'',0194 \{ + 1,0099 \times y - 0,0039 \times x - 0,1089 \times t + 2,1940 \times n \} + 0'',0214 \times f.$$

Final Equation:

$$+ 11'',64 = + 0,9160 \times e - 0,9206 \times x + 0,0214 \times f - 0,0239 \times y - 0,5090 \times t + 1,9470 \times m - 0,9839 \times n.$$

Disappearance of *g* Pleiadum, March 19,  $8^h . 9^m . 13^s,70 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$54 . 11 . 5,40 + 0,6311 \times t + x''$
Moon's Geocentric N.P.D. ....	$65 . 46 . 7,93 - 0,1645 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$59 . 35,24 \times (1 + 0,001 \times m)$
Moon's Geocentric Semidiameter .....	$16 . 14,23 \times (1 + 0,001 \times n)$
Star's Right Ascension in arc.....	$53 . 48 . 38,85 + e''$
Star's N.P.D. ....	$66 . 13 . 10,70 + f.$

Moon's apparent Right Ascension in arc	$53^{\circ}.34'.34''.75 + 0''.5612 \times t - 2''.1907 \times m + 1''.0049 \times x + 0''.0048 \times y$
Moon's apparent N.P.D. ....	$66^{\circ}.22'.55''.98 - 0''.1082 \times t + 2''.2081 \times m + 1''.0097 \times y - 0''.0039 \times x$
Moon's apparent Semidiameter.....	$16''.23,68 - 0,0006 \times t + 0,9837 \times n.$

Apparent Distance of Star from Moon's center:

$$16' . 9'',51 + 0'',7300 \{ + e - 1,0049 \times x - 0,0048 \times y - 0,5612 \times t + 2,1907 \times m \} \\ + 0'',6044 \{ + 1,0097 \times y - 0,0039 \times x - 0,1082 \times t + 2,2081 \times m \} - 0'',6030 \times f.$$

Final Equation:

$$+ 14'',17 = + 0,7300 \times e - 0,7359 \times x - 0,6030 \times f + 0,6068 \times y - 0,4745 \times t + 1,9338 \times m - 0,9837 \times n.$$

Disappearance of *Piazzi III. 135*, March 19,  $8^h.31^m.45^s.58 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$54.25.18,90 + 0,6316 \times t + ''$
Moon's Geocentric N.P.D. ....	$65.42.26,35 - 0,1608 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$59.34,46 \times (1 + 0,001 \times m)$
Moon's Geocentric Semidiameter .....	$16.14,03 \times (1 + 0,001 \times n)$
Star's Right Ascension in arc .....	$54.0.54,60 + e''$
Star's N.P.D. ....	$66.10.16,83 + f.$

Moon's apparent Right Ascension in arc	$53.47.22,98 + 0,5766 \times t - 2,2759 \times m + 1,0038 \times x + 0,0050 \times y$
Moon's apparent N.P.D. ....	$66.20.29,74 - 0,1023 \times t + 2,2834 \times m + 1,0089 \times y - 0,0041 \times x$
Moon's apparent Semidiameter.....	$16.22,64 - 0,0006 \times t + 0,9826 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.3'',11 + 0'',7062 \{ + e - 1,0038 \times x - 0,0050 \times y - 0,5766 \times t + 2,2759 \times m \} \\ + 0'',6370 \{ + 1,0089 \times y - 0,0041 \times x - 0,1023 \times t + 2,2834 \times m \} - 0'',6358 \times f.$$

Final Equation:

$$+ 19'',53 = + 0,7062 \times e - 0,7115 \times x - 0,6358 \times f + 0,6391 \times y - 0,4718 \times t + 3,0617 \times m - 0,9826 \times n.$$

Disappearance of *c Pleiadum*, March 19,  $8^h.38^m.48^s.56 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$54.29.46,05 + 0,6317 \times t + ''$
Moon's Geocentric N.P.D. ....	$65.41.17,30 - 0,1631 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$59.34,23 \times (1 + 0,001 \times m)$
Moon's Geocentric Semidiameter .....	$16.13,96 \times (1 + 0,001 \times n)$
Star's Right Ascension in arc.....	$54.3.50,70 + e''$
Star's N.P.D. ....	$66.8.17,90 + f.$

Moon's apparent Right Ascension in arc	$53.51.27,63 + 0,5815 \times t - 2,2984 \times m + 1,0035 \times x + 0,0050 \times y$
Moon's apparent N.P.D. ....	$66.19.44,89 - 0,1040 \times t + 2,3076 \times m + 1,0086 \times y - 0,0041 \times x$
Moon's apparent Semidiameter.....	$16.22,30 - 0,0006 \times t + 0,9823 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.6'',66 + 0'',6437 \{ + e - 1,0035 \times x - 0,0050 \times y - 0,5815 \times t + 2,2984 \times m \} \\ + 0'',7112 \{ + 1,0086 \times y - 0,0041 \times x - 0,1040 \times t + 2,3076 \times m \} - 0'',7102 \times f.$$

Final Equation:

$$+ 15'',64 = + 0,6437 \times e - 0,6489 \times x - 0,7102 \times f + 0,7141 \times y - 0,4477 \times t + 3,1206 \times m - 0,9823 \times n.$$



Reappearance of  $\delta$  Pleiadum, March 19,  $9^h.4^m.24^s.75 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$54.45.56.70 + 0.6321 \times t + \alpha''$
Moon's Geocentric N.P.D. ....	$65.37.7.72 - 0.1619 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$59.33.42 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$16.13.74 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc .....	$53.49.50.85 + e''$
Star's N.P.D. ....	$66.23.44.30 + f.$
Moon's apparent Right Ascension in arc	$54.6.33.66 + 0.5995 \times t - 2.3630 \times m + 1.0023 \times x + 0.0052 \times y$
Moon's apparent N.P.D. ....	$66.17.5.17 - 0.1011 \times t + 2.3975 \times m + 1.0076 \times y - 0.0042 \times x$
Moon's apparent Semidiameter.....	$16.21.09 - 0.0007 \times t + 0.9811 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.41''.49 + 0''.8402 \{ -e + 1.0023 \times x + 0.0052 \times y + 0.5995 \times t - 2.3630 \times m \} \\ - 0''.3977 \{ + 1.0076 \times y - 0.0042 \times x - 0.1011 \times t + 2.3975 \times m \} + 0''.3995 \times f.$$

Final Equation:

$$+ 20''.40 = - 0.8402 \times e + 0.8438 \times x + 0.3995 \times f - 0.3963 \times y + 0.4642 \times t - 2.9389 \times m - 0.9811 \times n.$$

Disappearance of  $\eta$  Tauri, March 19,  $9^h.15^m.32^s.45 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$54.52.58.95 + 0.6322 \times t + \alpha''$
Moon's Geocentric N.P.D. ....	$65.35.19.80 - 0.1614 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$59.33.07 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$16.13.64 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc.....	$54.28.51.60 + e''$
Star's N.P.D. ....	$66.23.42.90 + f.$
Moon's apparent Right Ascension in arc	$54.13.16.32 + 0.6073 \times t - 2.3826 \times m + 1.0017 \times x + 0.0052 \times y$
Moon's apparent N.P.D. ....	$66.15.57.09 - 0.1001 \times t + 2.4373 \times m + 1.0072 \times y - 0.0043 \times x$
Moon's apparent Semidiameter.....	$16.20.55 - 0.0007 \times t + 0.9806 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.15''.06 + 0''.8046 \{ +e - 1.0017 \times x - 0.0052 \times y - 0.6073 \times t + 2.3826 \times m \} \\ - 0''.4770 \{ + 1.0072 \times y - 0.0043 \times x - 0.1001 \times t + 2.4373 \times m \} + 0''.4786 \times f.$$

Final Equation:

$$+ 5''.49 = + 0.8046 \times e - 0.8039 \times x + 0.4786 \times f - 0.4846 \times y - 0.4402 \times t + 0.7544 \times m - 0.9806 \times n.$$

Reappearance of *c* Pleiadum, March 19,  $9^h.27^m.17^s.32 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$55^{\circ}.0'.24''.45 + 0''.6324 \times t + x''$
Moon's Geocentric N.P.D. ....	$65^{\circ}.33'.26''.26 - 0.1608 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$59'.32''.69 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$16'.13''.54 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc .....	$54^{\circ}.3'.50''.70 + e''$
Star's N.P.D. ....	$66^{\circ}.8'.17''.90 + f.$

Moon's apparent Right Ascension in arc	$54^{\circ}.20'.26''.80 + 0''.6158 \times t - 2''.3977 \times m + 1''.0012 \times x + 0''.0053 \times y$
Moon's apparent N.P.D. ....	$66^{\circ}.14'.45''.96 - 0.0991 \times t + 2.4797 \times m + 1.0067 \times y - 0.0043 \times x$
Moon's apparent Semidiameter .....	$16'.19''.99 - 0.0007 \times t + 0.9800 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.30''.52 + 0''.8418 \{ -e + 1.0012 \times x + 0.0053 \times y + 0.6158 \times t - 2.3977 \times m \} \\ + 0''.3927 \{ + 1.0067 \times y - 0.0043 \times x - 0.0991 \times t + 2.4797 \times m \} - 0''.3909 \times f.$$

Final Equation:

$$-10''.53 = -0.8418 \times e + 0.8411 \times x - 0.3909 \times f + 0.3998 \times y + 0.4801 \times t - 1.0446 \times m - 0.9800 \times n.$$

Reappearance of Uranus, Aug. 25,  $9^h.15^m.26^s.42 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$346^{\circ}.11'.29''.70 + 0''.5317 \times t + x''$
Moon's Geocentric N.P.D. ....	$96^{\circ}.0'.23''.64 - 0.2814 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$59'.32''.41 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$16'.13''.44 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc .....	$346^{\circ}.28'.21''.15 + e''$
Star's N.P.D. ....	$96^{\circ}.40'.51''.50 + f.$

Moon's apparent Right Ascension in arc	$346^{\circ}.41'.20''.37 + 0''.4408 \times t + 1''.7907 \times m + 1''.0063 \times x + 0''.0009 \times y$
Moon's apparent N.P.D. ....	$96^{\circ}.49'.27''.02 - 0.2665 \times t + 2.9434 \times m + 1.0048 \times y - 0.0010 \times x$
Moon's apparent Semidiameter .....	$16'.18''.02 + 0.0006 \times t + 0.9780 \times n.$

Apparent Distance of Star from Moon's center:

$$15'.29''.81 + 0''.8264 \{ -e + 1.0063 \times x + 0.0009 \times y + 0.4408 \times t + 1.7907 \times m \} \\ + 0''.5542 \{ + 1.0048 \times y - 0.0010 \times x - 0.2665 \times t + 2.9434 \times m \} - 0''.5546 \times f.$$

Final Equation:

$$+48''.21 = -0.8264 \times e + 0.8311 \times x - 0.5546 \times f + 0.5576 \times y + 0.2160 \times t + 3.1111 \times m - 0.9780 \times n.$$



Reappearance of  $\phi$  Aquarii, August 25,  $9^h.24^m.24^s.57 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$346.16.15.90 + 0.5317 \times t + ''$
Moon's Geocentric N.P.D. ....	$95.57.52.20 - 0.2815 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$59.32.56 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$16.13.48 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc.....	$346.30.40.20 + e''$
Star's N.P.D. ....	$96.54.33.80 + f.$

Moon's apparent Right Ascension in arc	$346.45.16.17 + 0.4360 \times t + 1.7403 \times m + 1.0066 \times x + 0.0009 \times y$
Moon's apparent N.P.D.....	$96.47.2.90 - 0.2671 \times t + 2.9507 \times m + 1.0052 \times y - 0.0010 \times x$
Moon's apparent Semidiameter.....	$16.18.39 + 0.0006 \times t + 0.9784 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.19''.66 + 0''.8813 \{ -e + 1.0066 \times x + 0.0009 \times y + 0.4360 \times t + 1.7403 \times m \} \\ - 0''.4605 \{ + 1.0052 \times y - 0.0010 \times x - 0.2671 \times t + 2.9507 \times m \} + 0''.4601 \times f.$$

Final Equation:

$$- 1''.27 = - 0.8813 \times e + 0.8876 \times x + 0.4601 \times f - 0.4621 \times y + 0.5066 \times t + 0.1749 \times m - 0.9784 \times n.$$

Disappearance of  $\eta$  Aquarii, August 25,  $11^h.30^m.6^s.61 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$347.23.3.90 + 0.5312 \times t + ''$
Moon's Geocentric N.P.D. ....	$95.22.24.44 - 0.2828 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$59.34.71 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$16.14.07 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc .....	$347.46.39.90 + e''$
Star's N.P.D. ....	$95.59.49.90 + f.$

Moon's apparent Right Ascension in arc	$347.36.29.82 + 0.3858 \times t + 0.8059 \times m + 1.0101 \times x + 0.0004 \times y$
Moon's apparent N.P.D.....	$96.12.41.18 - 0.2767 \times t + 3.0167 \times m + 1.0086 \times y - 0.0004 \times x$
Moon's apparent Semidiameter.....	$16.22.41 + 0.0003 \times t + 0.9824 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.21''.25 + 0''.6146 \{ +e - 1.0101 \times x - 0.0004 \times y - 0.3858 \times t - 0.8059 \times m \} \\ + 0''.7859 \{ + 1.0086 \times y - 0.0004 \times x - 0.2767 \times t + 3.0167 \times m \} - 0''.7861 \times f.$$

Final Equation:

$$+ 1''.16 = + 0.6146 \times e - 0.6211 \times x - 0.7861 \times f + 0.7924 \times y - 0.4549 \times t + 1.8755 \times m - 0.9824 \times n.$$

Reappearance of 96 Aquarii, Aug. 25, 12<sup>h</sup>. 37<sup>m</sup>. 28<sup>s</sup>. 78 +  $t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	347°. 58'. 50". 70 + 0". 5310 × $t$ + "
Moon's Geocentric N.P.D. ....	95°. 3'. 20. 02 - 0. 2835 × $t$ + $y$
Moon's Horizontal Equatoreal Parallax .....	59. 35. 82 × (1 + 0. 001 × $m$ )
Moon's Geocentric Semidiameter .....	16. 14. 37 × (1 + 0. 001 × $n$ )
Star's Right Ascension in arc .....	347. 46. 39. 90 + $e''$
Star's N.P.D. ....	95. 59. 49. 90 + $f$ .
Moon's apparent Right Ascension in arc 348. 2. 2. 06 + 0". 3753 × $t$ + 0". 1914 × $m$ + 1. 0108 × $x$ + 0. 0001 × $y$	
Moon's apparent N.P.D. ....	95. 53. 42. 72 - 0. 2821 × $t$ + 3. 0227 × $m$ + 1. 0094 × $y$ - 0. 0001 × $x$
Moon's apparent Semidiameter .....	16. 23. 47 + 0. 0001 × $t$ + 0. 9835 × $n$ .

Apparent Distance of Star from Moon's center:

$$16'. 27'', 96 + 0'', 9234 \{ -e + 1. 0108 \times x + 0. 0001 \times y + 0. 3753 \times t + 0. 1914 \times m \} \\ - 0'', 3719 \{ + 1. 0094 \times y - 0. 0001 \times x - 0. 2821 \times t + 3. 0227 \times m \} + 0'', 3715 \times f.$$

Final Equation:

$$-4'', 39 = -0. 9234 \times e + 0. 9234 \times x + 0. 3715 \times f - 0. 3753 \times y + 0. 4514 \times t - 0. 9474 \times m - 0. 9835 \times n.$$

Reappearance of  $\delta$  Pleiadum, Aug. 30, 9<sup>h</sup>. 36<sup>m</sup>. 51<sup>s</sup>. 85 +  $t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	53°. 47'. 8". 40 + 0". 6261 × $t$ + "
Moon's Geocentric N.P.D. ....	65. 33. 1. 19 - 0. 1563 × $t$ + $y$
Moon's Horizontal Equatoreal Parallax .....	59. 18. 07 × (1 + 0. 001 × $m$ )
Moon's Geocentric Semidiameter .....	16. 9. 58 × (1 + 0. 001 × $n$ )
Star's Right Ascension in arc .....	54. 12. 24. 45 + $e''$
Star's N.P.D. ....	66. 33. 15. 10 + $f$ .
Moon's apparent Right Ascension in arc 54. 24. 18. 08 + 0". 6877 × $t$ + 2. 2297 × $m$ + 0. 9957 × $x$ - 0. 0049 × $y$	
Moon's apparent N.P.D. ....	66. 21. 4. 72 - 0. 2131 × $t$ + 2. 8835 × $m$ + 1. 0021 × $y$ + 0. 0040 × $x$
Moon's apparent Semidiameter .....	16. 11. 53 + 0. 0006 × $t$ + 0. 9715 × $n$ .

Apparent Distance of Star from Moon's center:

$$16'. 20'', 53 + 0'', 6117 \{ -e + 0. 9957 \times x - 0. 0049 \times y + 0. 6877 \times t + 2. 2297 \times m \} \\ - 0'', 7442 \{ + 1. 0021 \times y + 0. 0040 \times x - 0. 2131 \times t + 2. 8835 \times m \} + 0'', 7452 \times f.$$

Final Equation:

$$-9'', 00 = -0. 6117 \times e + 0. 6061 \times x + 0. 7452 \times f - 0. 7488 \times y + 0. 5787 \times t - 0. 7820 \times m - 0. 9715 \times n.$$



Disappearance of *h* Pleiadum, August 30,  $9^h.57^m.3^s.19 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$53.59.47.10 + 0.6264 \times t + ''$
Moon's Geocentric N.P.D. ....	$65.29.52.37 - 0.1554 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$59.17.71 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$16.9.49 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc.....	$54.54.48.60 + e''$
Star's N.P.D. ....	$66.21.22.80 + f.$

Moon's apparent Right Ascension in arc $54.38.4.33 + 0.6748 \times t + 2.2972 \times m + 0.9966 \times x - 0.0051 \times y$	
Moon's apparent N.P.D. ....	$66.16.44.91 - 0.2142 \times t + 2.8125 \times m + 1.0029 \times y + 0.0041 \times x$
Moon's apparent Semidiameter.....	$16.12.20 + 0.0006 \times t + 0.9722 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.0'',76 + 0'',8768 \{ + e - 0.9966 \times x + 0.0051 \times y - 0.6748 \times t - 2.2972 \times m \} \\ - 0'',2884 \{ + 1.0029 \times y + 0.0041 \times x - 0.2142 \times t + 2.8125 \times m \} + 0'',2902 \times f.$$

Final Equation:

$$+ 11'',44 = + 0.8768 \times e - 0.8750 \times x + 0.2902 \times f - 0.2848 \times y - 0.5305 \times t - 2.8253 \times m - 0.9722 \times n.$$

Disappearance of *f* Pleiadum, August 30,  $10^h.2^m.8^s.42 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$54.2.58.20 + 0.6265 \times t + ''$
Moon's Geocentric N.P.D. ....	$65.29.4.97 - 0.1552 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$59.17.63 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$16.9.46 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc .....	$54.54.41.85 + e''$
Star's N.P.D. ....	$66.26.23.70 + f.$

Moon's apparent Right Ascension in arc $54.41.29.91 + 0.6715 \times t + 2.3117 \times m + 0.9969 \times x - 0.0051 \times y$	
Moon's apparent N.P.D. ....	$66.15.39.27 - 0.2144 \times t + 2.7943 \times m + 1.0031 \times y + 0.0041 \times x$
Moon's apparent Semidiameter.....	$16.12.37 + 0.0006 \times t + 0.9724 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.10'',33 + 0'',6849 \{ + e - 0.9969 \times x + 0.0051 \times y - 0.6715 \times t - 2.3117 \times m \} \\ - 0'',6636 \{ + 1.0031 \times y + 0.0041 \times x - 0.2144 \times t + 2.7943 \times m \} + 0'',6648 \times f.$$

Final Equation:

$$+ 2'',04 = + 0.6849 \times e - 0.6855 \times x + 0.6648 \times f - 0.6622 \times y - 0.3182 \times t - 3.3576 \times m - 0.9724 \times n.$$

Disappearance of  $\chi^3$  Capricorni, Sept. 19,  $10^h.18^m.44^s.21 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$315.3.21.30 + 0.5625 \times t + x''$
Moon's Geocentric N.P.D. ....	$110.8.37.30 - 0.2002 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$57.53.24 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$15.46.45 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc .....	$315.6.0.90 + e''$
Star's N.P.D. ....	$111.11.39.20 + f.$

Moon's apparent Right Ascension in arc	$314.51.37.41 + 0.4097 \times t - 0.7039 \times m + 1.0106 \times x - 0.0013 \times y$
Moon's apparent N.P.D. ....	$111.3.15.95 - 0.2169 \times t + 3.2787 \times m + 1.0047 \times y + 0.0011 \times x$
Moon's apparent Semidiameter .....	$15.50.77 - 0.0002 \times t + 0.9508 \times n.$

Apparent Distance of Star from Moon's center:

$$15'.49''.75 + 0''.7912 \{ + e - 1.0106 \times x + 0.0013 \times y - 0.4097 \times t + 0.7039 \times m \} \\ - 0''.5305 \{ + 1.0047 \times y + 0.0011 \times x - 0.2169 \times t + 3.2787 \times m \} + 0''.5293 \times f.$$

Final Equation :

$$+ 1''.02 = + 0.7912 \times e - 0.8002 \times x + 0.5293 \times f - 0.5320 \times y - 0.2089 \times t - 1.1824 \times m - 0.9508 \times n.$$

Disappearance of  $\epsilon$  Pleiadum, Sept. 26,  $16^h.27^m.38^s.26 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$53.50.25.35 + 0.6446 \times t + x''$
Moon's Geocentric N.P.D. ....	$65.33.18.60 - 0.1606 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$60.10.01 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$16.23.74 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc .....	$53.55.27.15 + e''$
Star's N.P.D. ....	$66.2.16.40 + f.$

Moon's apparent Right Ascension in arc	$53.37.26.12 + 0.4822 \times t - 0.7792 \times m + 1.0113 \times x + 0.0017 \times y$
Moon's apparent N.P.D. ....	$66.2.20.29 - 0.1402 \times t + 1.7417 \times m + 1.0150 \times y - 0.0014 \times x$
Moon's apparent Semidiameter .....	$16.38.66 - 0.0002 \times t + 0.9987 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.27''.87 + 0''.9139 \{ + e - 1.0113 \times x - 0.0017 \times y - 0.4822 \times t + 0.7792 \times m \} \\ + 0''.0050 \{ + 1.0150 \times y - 0.0014 \times x - 0.1402 \times t + 1.7417 \times m \} - 0''.0028 \times f.$$

Final Equation :

$$+ 10''.79 = + 0.9139 \times e - 0.9242 \times x - 0.0028 \times f + 0.0035 \times y - 0.4412 \times t + 0.7208 \times m - 0.9987 \times n.$$



Disappearance of *c* Pleiadum, Sept. 26,  $16^h.53^m.55^s.36 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$54. 7. 22.35 + 0.6451 \times t + x$
Moon's Geocentric N.P.D. ....	$65.29. 6.42 - 0.1593 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$60. 9.43 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$16.23.59 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc.....	$54. 4.46.05 + e''$
Star's N.P.D. ....	$66. 8. 8.50 + f.$

Moon's apparent Right Ascension in arc	$53.50.17.86 + 0.4896 \times t - 1.0245 \times m + 1.0108 \times x + 0.0023 \times y$
Moon's apparent N.P.D.....	$65.58.40.40 - 0.1325 \times t + 1.7740 \times m + 1.0146 \times y - 0.0018 \times x$
Moon's apparent Semidiameter.....	$16.38.12 - 0.0003 \times t + 0.9981 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.15'',88 + 0'',7432 \{ + e - 1.0108 \times x - 0.0023 \times y - 0.4896 \times t + 1.0245 \times m \} \\ - 0'',5814 \{ + 1.0146 \times y - 0.0018 \times x - 0.1325 \times t + 1.7740 \times m \} + 0'',5828 \times f.$$

Final Equation:

$$+ 22'',24^* = + 0.7432 \times e - 0.7502 \times x + 0.5828 \times f - 0.5916 \times y - 0.2866 \times t - 0.2699 \times m - 0.9981 \times n.$$

\* This does not agree with the result of the calculation of the Reappearance unless we may suppose an error of  $1^m$  in excess in the noted time of observation.

Reappearance of *g* Pleiadum, Sept. 26,  $17^h.5^m.0^s.34 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$54. 14.31.35 + 0.6453 \times t + x$
Moon's Geocentric N.P.D. ....	$65.27.20.69 - 0.1588 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$60. 9.19 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$16.23.52 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc.....	$53.49.34.35 + e''$
Star's N.P.D. ....	$66.13. 1.20 + f.$

Moon's apparent Right Ascension in arc	$53.55.37.82 + 0.4937 \times t - 1.1335 \times m + 1.0106 \times x + 0.0025 \times y$
Moon's apparent N.P.D.....	$65.57.13.01 - 0.1291 \times t + 1.7923 \times m + 1.0144 \times y - 0.0020 \times x$
Moon's apparent Semidiameter.....	$16.37.83 - 0.0003 \times t + 0.9978 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.44'',72 + 0''3024 \{ - e + 1.0106 \times x + 0.0025 \times y + 0.4937 \times t - 1.1335 \times m \} \\ - 0'',9437 \{ + 1.0144 \times y - 0.0020 \times x - 0.1291 \times t + 1.7923 \times m \} + 0'',9439 \times f.$$

Final Equation:

$$- 6'',89 = - 0.3024 \times e + 0.3075 \times x + 0.9439 \times f - 0.9565 \times y + 0.2714 \times t - 2.0342 \times m - 0.9978 \times n.$$

Reappearance of *e* Pleiadum, Sept. 26,  $17^h.35^m.48^s.90 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$54.34.24,60 + 0,6458 \times t + x''$
Moon's Geocentric N.P.D. ....	$65.22.28,58 - 0,1573 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$60.8,51 \times (1 + 0,001 \times m)$
Moon's Geocentric Semidiameter .....	$16.23,33 \times (1 + 0,001 \times n)$
Star's Right Ascension in arc .....	$53.55.27,15 + e''$
Star's N.P.D. ....	$66.2.16,40 + f.$
Moon's apparent Right Ascension in arc	$54.10.59,80 + 0,5058 \times t - 1,4048 \times m + 1,0098 \times x + 0,0031 \times y$
Moon's apparent N.P.D. ....	$65.53.18,11 - 0,1205 \times t + 1,8495 \times m + 1,0138 \times y - 0,0025 \times x$
Moon's apparent Semidiameter.....	$16.36,98 - 0,0004 \times t + 0,9970 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.47'',61 + 0'',7722 \{ -e + 1,0098 \times x + 0,0031 \times y + 0,5058 \times t - 1,4048 \times m \} \\ - 0'',5334 \{ + 1,0138 \times y - 0,0025 \times x - 0,1205 \times t + 1,8495 \times m \} + 0'',5350 \times f.$$

Final Equation:

$$- 10'',63 = - 0,7722 \times e + 0,7811 \times x + 0,5350 \times f - 0,5384 \times y + 0,4553 \times t - 2,0713 \times m - 0,9970 \times n.$$

Reappearance of *c* Pleiadum, Sept. 26,  $17^h.38^m.42^s.43 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$54.36.16,65 + 0,6459 \times t + x''$
Moon's Geocentric N.P.D. ....	$65.22.1,29 - 0,1571 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$60.8,43 \times (1 + 0,001 \times m)$
Moon's Geocentric Semidiameter .....	$16.23,31 \times (1 + 0,001 \times n)$
Star's Right Ascension in arc.....	$54.4.46,05 + e''$
Star's N.P.D. ....	$66.8.8,50 + f.$
Moon's apparent Right Ascension in arc	$54.12.27,55 + 0,5072 \times t - 1,4291 \times m + 1,0097 \times x + 0,0032 \times y$
Moon's apparent N.P.D. ....	$65.52.56,87 - 0,1196 \times t + 1,8556 \times m + 1,0137 \times y - 0,0026 \times x$
Moon's apparent Semidiameter.....	$16.36,89 - 0,0004 \times t + 0,9969 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.44'',41 + 0'',3835 \{ -e + 1,0097 \times x + 0,0032 \times y + 0,5072 \times t - 1,4291 \times m \} \\ - 0'',9074 \{ + 1,0137 \times y - 0,0026 \times x - 0,1196 \times t + 1,8556 \times m \} + 0'',9078 \times f.$$

Final Equation:

$$- 7'',52 = - 0,3835 \times e + 0,3896 \times x + 0,9078 \times f - 0,9168 \times y + 0,3034 \times t - 2,2318 \times m - 0,9969 \times n.$$



Reappearance of  $\phi$  Aquarii, October 19,  $6^h.8^m.58^s.21 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....  $346.16.10,65 + 0,5305 \times t + ''$

Moon's Geocentric N.P.D. ....  $95.54.13,69 - 0,2797 \times t + y$

Moon's Horizontal Equatoreal Parallax .....  $59.29,99 \times (1 + 0,001 \times m)$

Moon's Geocentric Semidiameter .....  $16.12,87 \times (1 + 0,001 \times n)$

Star's Right Ascension in arc .....  $346.30.42,00 + e''$

Star's N.P.D. ....  $96.54.33,30 + f.$

Moon's apparent Right Ascension in arc  $346.42.58,19 + 0,4240 \times t + 1,6075 \times m + 1,0074 \times x + 0,0008 \times y$

Moon's apparent N.P.D. ....  $96.43.39,04 - 0,2665 \times t + 2,9654 \times m + 1,0059 \times y - 0,0009 \times x$

Moon's apparent Semidiameter .....  $16.18,50 + 0,0005 \times t + 0,9785 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.21'',02 + 0'',7398 \{ -e + 1,0074 \times x + 0,0008 \times y + 0,4240 \times t + 1,6075 \times m \} \\ - 0'',6672 \{ + 1,0059 \times y - 0,0009 \times x - 0,2665 \times t + 2,9654 \times m \} + 0'',6668 \times f.$$

Final Equation:

$$- 2'',52 = - 0,7398 \times e + 0,7459 \times x + 0,6668 \times f - 0,6705 \times y + 0,4910 \times t - 0,7893 \times m - 0,9785 \times n.$$

Disappearance of 96 Aquarii, October 19,  $8^h.14^m.55^s.08 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....  $347.23.1,35 + 0,5309 \times t + ''$

Moon's Geocentric N.P.D. ....  $95.18.53,00 - 0,2815 \times t + y$

Moon's Horizontal Equatoreal Parallax .....  $59.34,71 \times (1 + 0,001 \times m)$

Moon's Geocentric Semidiameter .....  $16.14,15 \times (1 + 0,001 \times n)$

Star's Right Ascension in arc .....  $347.46.42,15 + e''$

Star's N.P.D. ....  $95.59.49,20 + f.$

Moon's apparent Right Ascension in arc  $347.33.13,00 + 0,3808 \times t + 0,6117 \times m + 1,0104 \times x + 0,0003 \times y$

Moon's apparent N.P.D. ....  $96.9.14,99 - 0,2769 \times t + 3,0220 \times m + 1,0089 \times y - 0,0003 \times x$

Moon's apparent Semidiameter .....  $16.22,81 + 0,0002 \times t + 0,9828 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.23'',62 + 0'',8134 \{ +e - 1,0104 \times x - 0,0003 \times y - 0,3808 \times t - 0,6117 \times m \} \\ + 0'',5751 \{ + 1,0089 \times y - 0,0003 \times x - 0,2769 \times t + 3,0220 \times m \} - 0'',5755 \times f.$$

Final Equation:

$$- 0'',81 = + 0,8134 \times e - 0,8220 \times x - 0,5755 \times f + 0,5800 \times y - 0,4692 \times t + 1,2404 \times m - 0,9828 \times n.$$

Reappearance of 96 Aquarii, Oct. 19,  $9^h.25^m.11^s.12 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$348.0.20.55 + 0.5313 \times t + ''$
Moon's Geocentric N.P.D. ....	$94.59.4.00 - 0.2824 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$59.37.32 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$16.14.86 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc .....	$347.46.42.15 + e''$
Star's N.P.D. ....	$95.59.49.20 + f.$

Moon's apparent Right Ascension in arc	$347.59.39.62 + 0.3750 \times t - 0.0409 \times m + 1.0108 \times x$
Moon's apparent N.P.D.....	$95.49.26.41 - 0.2827 \times t + 3.0224 \times m + 1.0094 \times y$
Moon's apparent Semidiameter.....	$16.24.03 + 0.9840 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.32'',93 + 0'',7748 \{ -e + 1.0108 \times x + 0.3750 \times t - 0.0409 \times m \} \\ - 0'',6274 \{ + 1.0094 \times y - 0.2827 \times t + 3.0224 \times m \} + 0'',6270 \times f.$$

Final Equation:

$$-8'',90 = -0.7748 \times e + 0.7832 \times x + 0.6270 \times f - 0.6333 \times y + 0.4679 \times t - 1.9279 \times m - 0.9840 \times n.$$

Disappearance of  $\mu$  Arietis, Nov. 19,  $13^h.46^m.34^s.39 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....	$38.38.54.30 + 0.6322 \times t + ''$
Moon's Geocentric N.P.D. ....	$70.16.19.52 - 0.2250 \times t + y$
Moon's Horizontal Equatoreal Parallax .....	$61.17.71 \times (1 + 0.001 \times m)$
Moon's Geocentric Semidiameter .....	$16.42.19 \times (1 + 0.001 \times n)$
Star's Right Ascension in arc .....	$38.20.22.65 + e''$
Star's N.P.D. ....	$70.40.11.80 + f.$

Moon's apparent Right Ascension in arc	$38.9.40.57 + 0.5173 \times t - 1.7537 \times m + 1.0080 \times x + 0.0030 \times y$
Moon's apparent N.P.D.....	$70.53.26.47 - 0.1869 \times t + 2.2270 \times m + 1.0118 \times y - 0.0026 \times x$
Moon's apparent Semidiameter.....	$16.54.09 - 0.0005 \times t + 1.0141 \times n.$

Apparent Distance of Star from Moon's center:

$$16'.39'',54 + 0'',5728 \{ +e - 1.0080 \times x - 0.0030 \times y - 0.5173 \times t + 1.7537 \times m \} \\ + 0'',7954 \{ + 1.0118 \times y - 0.0026 \times x - 0.1869 \times t + 2.2270 \times m \} - 0'',7948 \times f.$$

Final Equation:

$$+14'',55 = +0.5728 \times e - 0.5795 \times x - 0.7948 \times f + 0.8031 \times y - 0.4445 \times t + 2.7759 \times m - 1.0141 \times n.$$



Disappearance of *b* Pleiadum, Nov. 20,  $13^h.1^m.9^s.74 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....  $53.52.4.35 + 0.6761 \times t + x''$

Moon's Geocentric N.P.D. ....  $65.42.20.32 - 0.1645 \times t + y$

Moon's Horizontal Equatoreal Parallax .....  $.61.22.30 \times (1 + 0.001 \times m)$

Moon's Geocentric Semidiameter .....  $16.43.44 \times (1 + 0.001 \times n)$

Star's Right Ascension in arc .....  $53.51.3.00 + e''$

Star's N.P.D. ....  $66.23.30.50 + f$

Moon's apparent Right Ascension in arc  $53.37.10.54 + 0.5136 \times t - 0.8938 \times m + 1.0113 \times x + 0.0020 \times y$

Moon's apparent N.P.D. ....  $66.12.19.12 - 0.1413 \times t + 1.7988 \times m + 1.0151 \times y - 0.0016 \times x$

Moon's apparent Semidiameter .....  $16.58.79 - 0.0003 \times t + 1.0188 \times n$

Apparent Distance of Star from Moon's center:

$$16'.55'',76 + 0'',6871 \{ + e - 1.0113 \times x - 0.0020 \times y - 0.5136 \times t + 0.8938 \times m \} \\ - 0'',6604 \{ + 1.0151 \times y - 0.0016 \times x - 0.1413 \times t + 1.7988 \times m \} + 0'',6616 \times f.$$

Final Equation:

$$+ 3'',03 = + 0.6871 \times e - 0.6938 \times x + 0.6616 \times f - 0.6718 \times y - 0.2593 \times t - 0.5738 \times m - 1.0188 \times n.$$

Reappearance of 49 Leonis, Dec. 24,  $19^h.12^m.15^s.46 + t^s$  Greenwich Mean Solar Time.

Moon's Geocentric Right Ascension in arc .....  $157.10.43.05 + 0.4937 \times t + x''$

Moon's Geocentric N.P.D. ....  $80.5.52.71 + 0.2435 \times t + y$

Moon's Horizontal Equatoreal Parallax .....  $.56.53.35 \times (1 + 0.001 \times m)$

Moon's Geocentric Semidiameter .....  $15.30.10 \times (1 + 0.001 \times n)$

Star's Right Ascension in arc .....  $156.39.45.60 + e''$

Star's N.P.D. ....  $80.31.27.20 + f$

Moon's apparent Right Ascension in arc  $156.45.51.50 + 0.3862 \times t - 1.4916 \times m + 1.0074 \times x + 0.0013 \times y$

Moon's apparent N.P.D. ....  $80.46.2.40 + 0.2602 \times t + 2.4097 \times m + 1.0094 \times y - 0.0011 \times x$

Moon's apparent Semidiameter .....  $15.38.86 - 0.0005 \times t + 0.9389 \times n$

Apparent Distance of Star from Moon's center:

$$15'.46'',74 + 0''3763 \{ - e + 1.0074 \times x + 0.0013 \times y + 0.3862 \times t - 1.4916 \times m \} \\ - 0'',9246 \{ + 1.0094 \times y - 0.0011 \times x + 0.2602 \times t + 2.4097 \times m \} - 0'',9244 \times f.$$

Final Equation:

$$- 7'',88 = - 0.3763 \times e + 0.3781 \times x - 0.9244 \times f + 0.9338 \times y + 0.3864 \times t + 1.6667 \times m - 0.9389 \times n.$$







University of Cambridge.  
Observatory.  
Astronomical observations.



